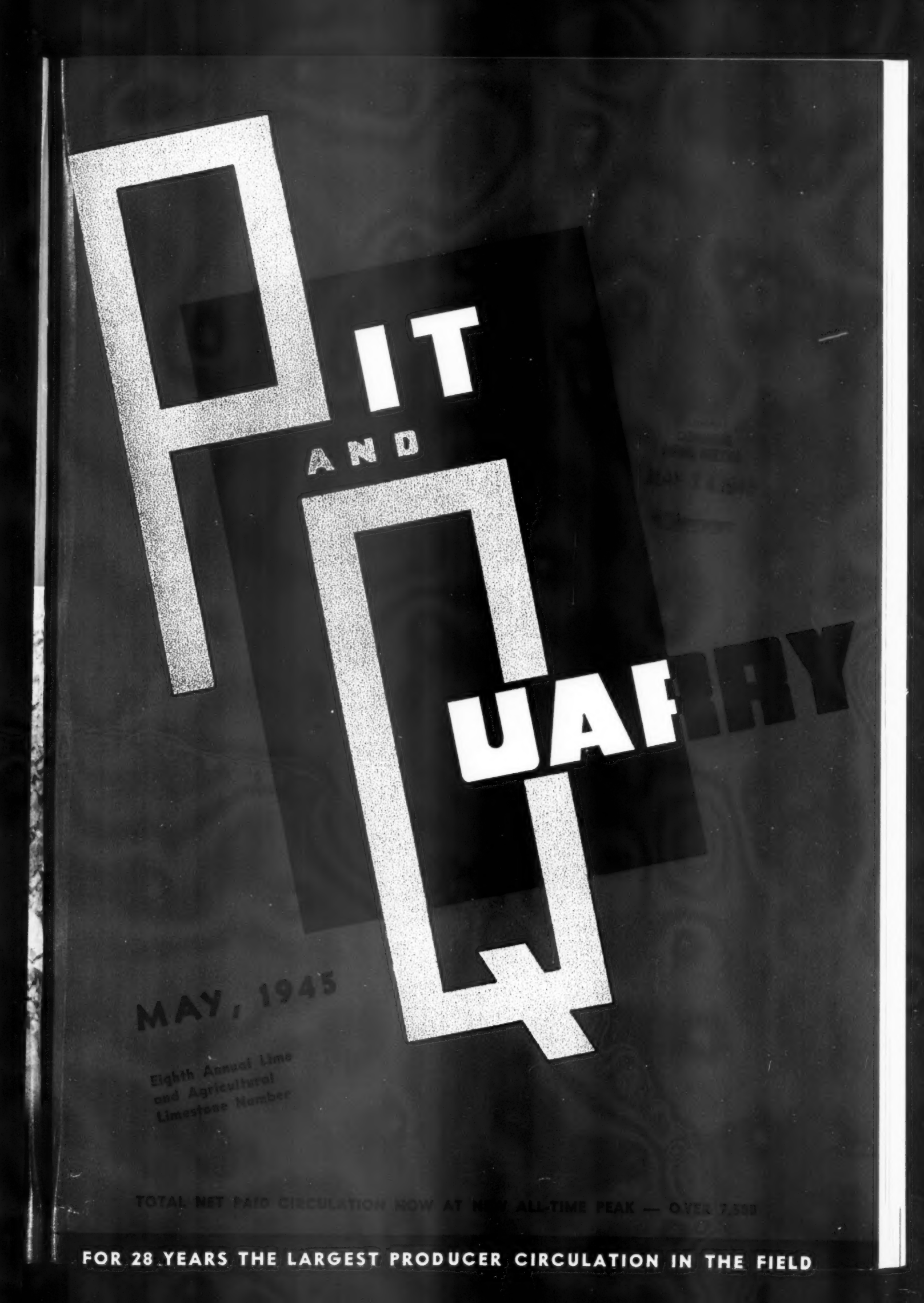
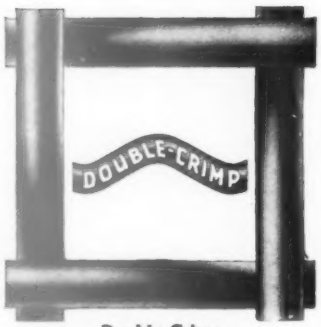
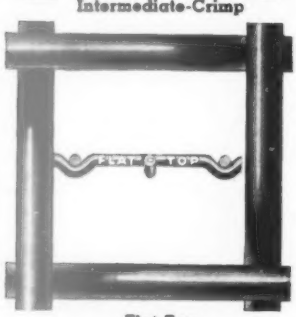

PIT
AND
QUARRY
MAY, 1945
Eighth Annual Lime
and Agricultural
Limestone Number
TOTAL NET PAID CIRCULATION NOW AT
ALL-TIME PEAK — OVER
FOR 28 YEARS THE LARGEST PRODUCER CIRCULATION IN THE FIELD



Double-Crimp

Arch-Crimp

Intermediate-Crimp



Flat-Top

"The Perfect"

Wire Cloths and Screens

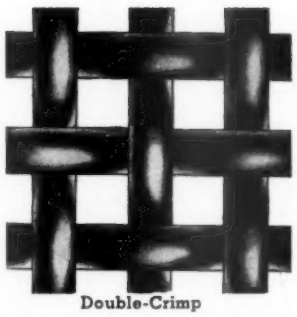
We have been specialists for many years in the making of precision wire cloths, wire screens and woven wire products.

We apply our same precision principles in fabricating wire cloths into finished industrial units, for production or processing equipments or for permanent parts of countless industrial products.

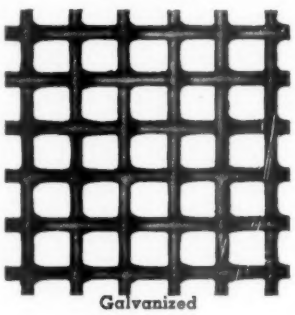
We invite your inquiries for wire cloths of all commercial metals or alloys or weaves, in continuous lengths or cut to size, or processed to meet your individual requirements.

"Perfect" alloys and metals	"Perfect" Wire Cloth weaves	"Perfect" Wire Cloth Processing	"Perfect" Wire Cloth products
Super-Loy	Arch-Crimp	Bending	Baskets
Steel	Coiled	Binding	Circles
Galvanized	Double-Crimp	Brazing	Cones
Tinned	Double-Fill	Calendering	Crates
Stainless Steel	Dutch	Clinching	Cylinders
Nickel-Chromium alloys	Filter	Cutting	Discs
Aluminum	Flat-Top	Dipping	Forms
Brass	Herringbone-Twill	Dishing	Leaves
Bronze	Intermediate-crimp	Flanging	Lengths
Commercial Phosphor	Rek-Tang	Flattening	Panels
Copper	Selvage-Edge	Forming	Pieces
Monel Metal	Straight-Warp	Framing	Racks
Nickel	Stranded	Galvanizing	Ribbons
Any special alloys available in rod or wire form	Sta-Tru	Painting	Rolls
	Triple-Warp	Shearing	Sections
	Twilled	Slitting	Segments
	Twisted-Fill	Trimming	Spaces
	Twisted-Warp	Arc-Welding	Strips
		Gas-Welding	Template shapes
		Spot-Welding	Trays

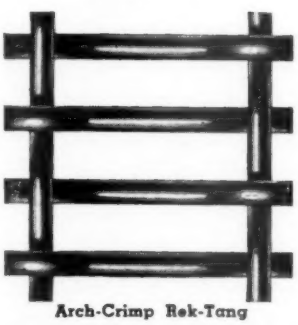
We will follow your specifications and blue-prints exactly as your production engineers have prepared them—or we will submit suggestions for your approval.



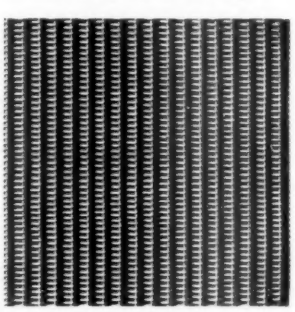
Double-Crimp



Galvanized



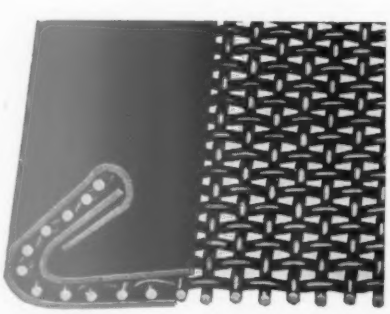
Arch-Crimp Rek-Tang



Dutch Weave

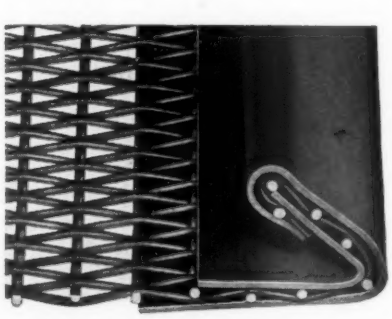
The LUDLOW-SAYLOR WIRE COMPANY ST. LOUIS

Newstead Avenue & Wabash R.R. Zone 10



LUDLOW-SAYLOR PRECISION FABRICATING makes vibrating-screen decks and jackets that are easily handled — quickly installed — need fewer adjustments and renewals.

Illustrations suggest only a few of the many available types of wire cloths and woven wire screens, which may be custom-finished with attachments to fit your particular processing installations.



"The Ultimate in a *Mechanized Quarry*"

Loading rock at the quarry face. Payload is 15 tons. Cedar Hollow Plant of Warner Company, Devault, Pa.

EASTON overhead hoist, electrically operated by remote control, tips 15-ton loads quickly or feeds large rocks one at a time as required.

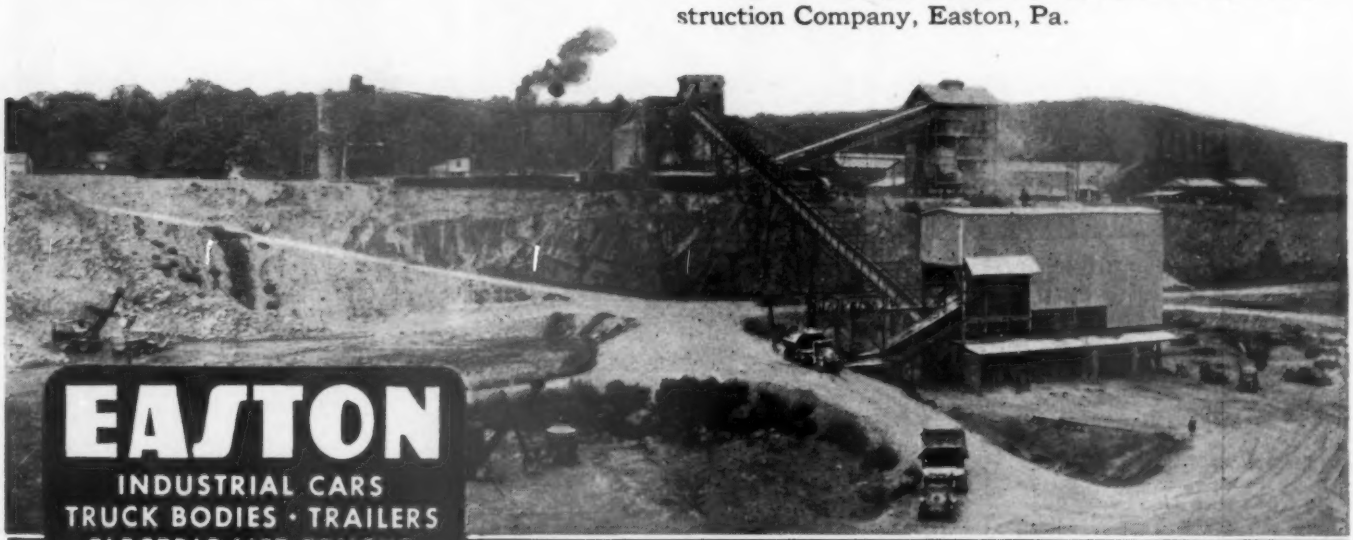
"Day after day the tractor-trailers move from quarry face to primary crusher . . . quietly, smoothly, and with no evidence of strain on either men or equipment."

"After six months' operation our records show no lost time charged to this system of conveyance . . . one which we consider to be the ultimate in a mechanized quarry operation."

This statement by Mr. Wilson, General Superintendent of the Lime Division, comes after conversion to **EASTON** Model TR-10 Semi-Trailers.

Semi-trailer haulage really pays dividends!

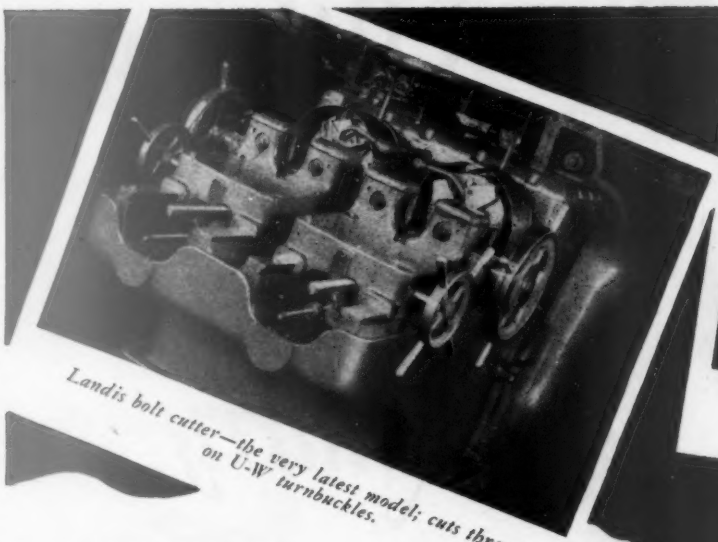
Write to: Engineering Counsel, Easton Car & Construction Company, Easton, Pa.



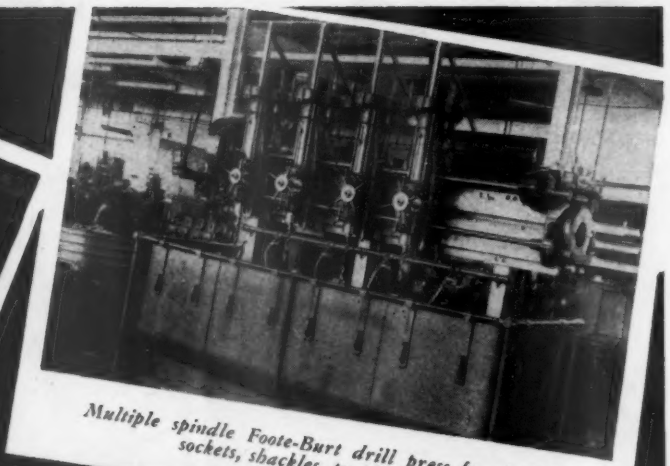
EASTON
INDUSTRIAL CARS
TRUCK BODIES · TRAILERS
ELECTRIC LIFT TRUCKS

B-1015

PIT AND QUARRY, May, 1945. Vol. 37, No. 11. Published monthly by the Complete Service Publishing Company, 528 South Clark Street, Chicago 5, Ill. Subscription price $3 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 50 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1897.



Landis bolt cutter—the very latest model; cuts threads on U-W turnbuckles.



Multiple spindle Foote-Burt drill press for drilling sockets, shackles, turnbuckles.

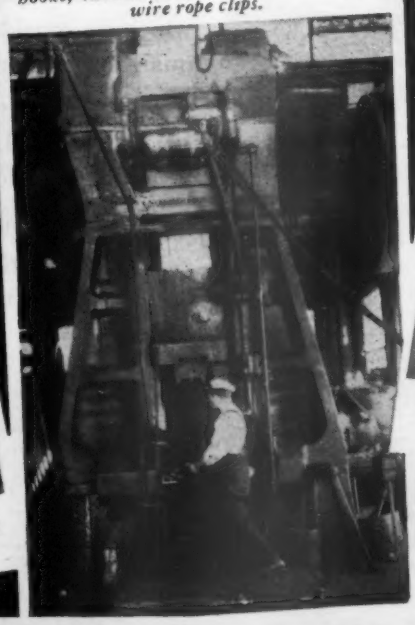
THE NEWEST, FINEST EQUIPMENT...

Another reason Upson-Walton Products are Better Products

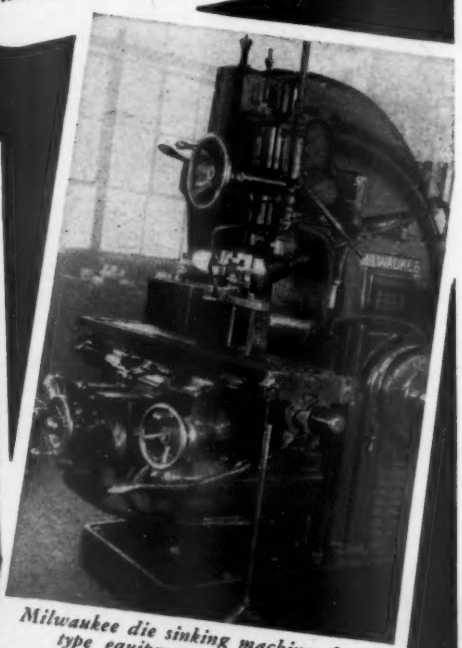
Illustrated are just a few of the machines—all of them the very finest and newest of their kind—used for making these U-W products:

TACKLE BLOCKS • SOCKETS • EYE BOLTS
TURNBUCKLES • THIMBLES • SWIVELS
SHACKLES • HOOKS • WIRE ROPE CLIPS

Latest design 200-ton press for blanking and forming tackle block parts.



4000-pound Chambersburg drop hammer —most up-to-date model—for forging hooks, turnbuckles, sockets, shackles, wire rope clips.



Milwaukee die sinking machine, finest type equipment perfected for making U-W dies and tools.

THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks

MAIN OFFICES AND FACTORY: CLEVELAND 13, OHIO

114 Broad Street, New York 4 | 737 West Jackson Boulevard, Chicago 6 | 241 Oliver Building, Pittsburgh 22

THERE's no tougher job for air hose than service in quarries or on big construction projects. It's got to be plenty rugged to take the abuse of being yanked over jagged surfaces, smashed by falling rocks, dragged around razor-sharp corners. That's why Goodyear Redwing H Cord Air Hose is first choice for all heavy-duty jobs.

Here's an air carrier that's tough, willing and able to stand the gaff of the most punishing air hose jobs. Redwing has always been top quality—and now it's even better than it ever was before.

Why? Because Redwing is now built of a special synthetic rubber that is both oil- and weather-resisting. Its tube won't flake off and clog tools and its cover won't crack from exposure to heat or cold. What's more—the synthetic used in building Redwing is highly resistant to both abrasion and cutting—the kind of material that takes the heaviest-duty jobs right in its stride. And—while Redwing is extremely flexible, it won't kink, won't strangle tools or equipment.

Redwing H Cord Air Hose is doing yeoman duty in shipyards, steel mills, quarries, mines, heavy war industries of all kinds. Wherever it's in use, it is giving an outstanding account of itself, smoothing the flow of production and keeping maintenance costs and need for replacement at the minimum. Try it yourself—and you'll soon learn why users are so enthusiastic about this heavy-duty hose.

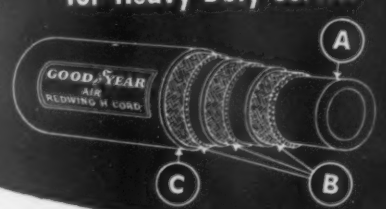
Made in continuous lengths, in seven sizes up to 1½" diameter. Order from the G.T.M.—Goodyear Technical Man—or phone your nearest Goodyear Industrial Rubber Products Distributor.

Redwing—T. M. The Goodyear Tire & Rubber Company

GOODYEAR INDUSTRIAL RUBBER PRODUCTS

GTM-Specified

Redwing H Cord Air Hose for Heavy-Duty Service



A Highest quality synthetic rubber tube, non-porous, impermeable to oil

B Multiple braids of cabled cotton cord give high safety factor

C Heavy-gauge, high-tensile cover resistant to cutting; non-oxidizing

GOODYEAR

THE GREATEST NAME IN RUBBER

ALL OUT FOR THE MIGHTY 7TH — BUY MORE WAR BONDS!

SMOOTH AS OIL!

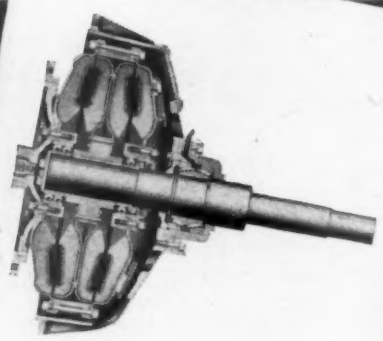
No shock—no stall—
no loafing—with
FLUID-DRIVE
LORAIN 82!

YOU can tackle a mountain of rock—or any other tough job—with a Lorain 82 and get the most out of every work-minute! These husky shovels are equipped with a life-saving, shock-absorbing hydraulic coupling that smooths out heaviest digging shocks and keeps the engine pulling at peak power under toughest loads. You just can't stall the engine!

No matter how big the rock or how tight it's lodged, the Lorain 82 hangs on until it's in the dipper. Sudden jerks, impacts and other shocks are cushioned by the spinning oil clutch—eliminating stress and strain on mechanism and cables and greatly lessening operator fatigue.

Combine this life-prolonging feature with Lorain center-drive direct-to-the-point power application, two-speed chain drive crawler, all-steel all-welded boom, all-steel dipper stick and new, streamlined dipper and you've got the ideal rock shovel—the Lorain 82!

If you want shovel performance that's literally "smooth as oil" and new, low per-yard handling costs, write for complete data on the shockproofed shovel.



Power for the Lorain 82 flows through this hydraulic coupling. Shocks impacts and sudden strains on the mechanism and cables are cushioned and absorbed by the fluid connection.

Reg. Trade Mark

thew Lorain

THE
THEW SHOVEL COMPANY
LORAIN, OHIO

CRANES • SHOVELS • DRAGLINES • MOTO-CRANES

PRINT IN BL

BUILD BETTER *Postwar* VACATIONLAND ROADS!

with aggregate from a CEDARAPIDS JUNIOR TANDEM!

When gasoline rationing becomes a memory and the call of the open road can be answered, the new and improved highways that must be built through remote vacationlands will provide many profitable jobs for contractors with the proper equipment. In the Cedarapids line of portable plants there is just the size and type to fit every aggregate production requirement. The Junior Tandem is a typical example, has plenty of belt capacity to handle all kinds of pit conditions, ample extra screen capacity for those tougher screening jobs, and the extra secondary crushing capacity for the production of either fine or coarse aggregate. The entire plant is mounted on one steel truck chassis equipped with pneumatic tires, ready to move to the mountains, parks, or forests from one job to another. Let your Iowa dealer tell you about the profit opportunities you can have with Cedarapids equipment.

Cedarapids
Built by IOWA

HE IOWA LINE

Material Handling Equipment Includes

CK AND GRAVEL CRUSHERS
ELT CONVEYORS
STEEL BINS
CKET ELEVATORS
VIBRATOR AND
VOLVING SCREENS
RAIGHT LINE ROCK
D GRAVEL PLANTS
FEEDERS—TRAPS
ORTABLE POWER CONVEYORS
ORTABLE STONE PLANTS
ORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

ARMY E NAVY

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa

T IN BINDING

HERE'S EXPER

The SOCONY-VACUUM REPRESENTATIVE bring you the most Complete Lubrication Service ever offered Contractors—Designed to save time on the Job, in your Maintenance Department—all through your operation!

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates:
Magnolia Petroleum Co., General Petroleum Corp. of Calif.

HENCED HELP!

● When you buy oils and greases—do you get *real help in meeting contract deadlines?* That's what this new Socony-Vacuum service offers!

Along with our complete line of quality lubricants—the exactly right oil or grease for every piece of equipment you operate—you get practical maintenance and engineering aid...the kind that helps speed up your entire operation.

For instance, we supply you with job-tested maintenance schedules, plans and surveys especially geared to fit your individual requirements. The Socony-Vacuum Representative works with your men—helps analyze and solve time-losing problems—steps in when needed with skilled technical help!

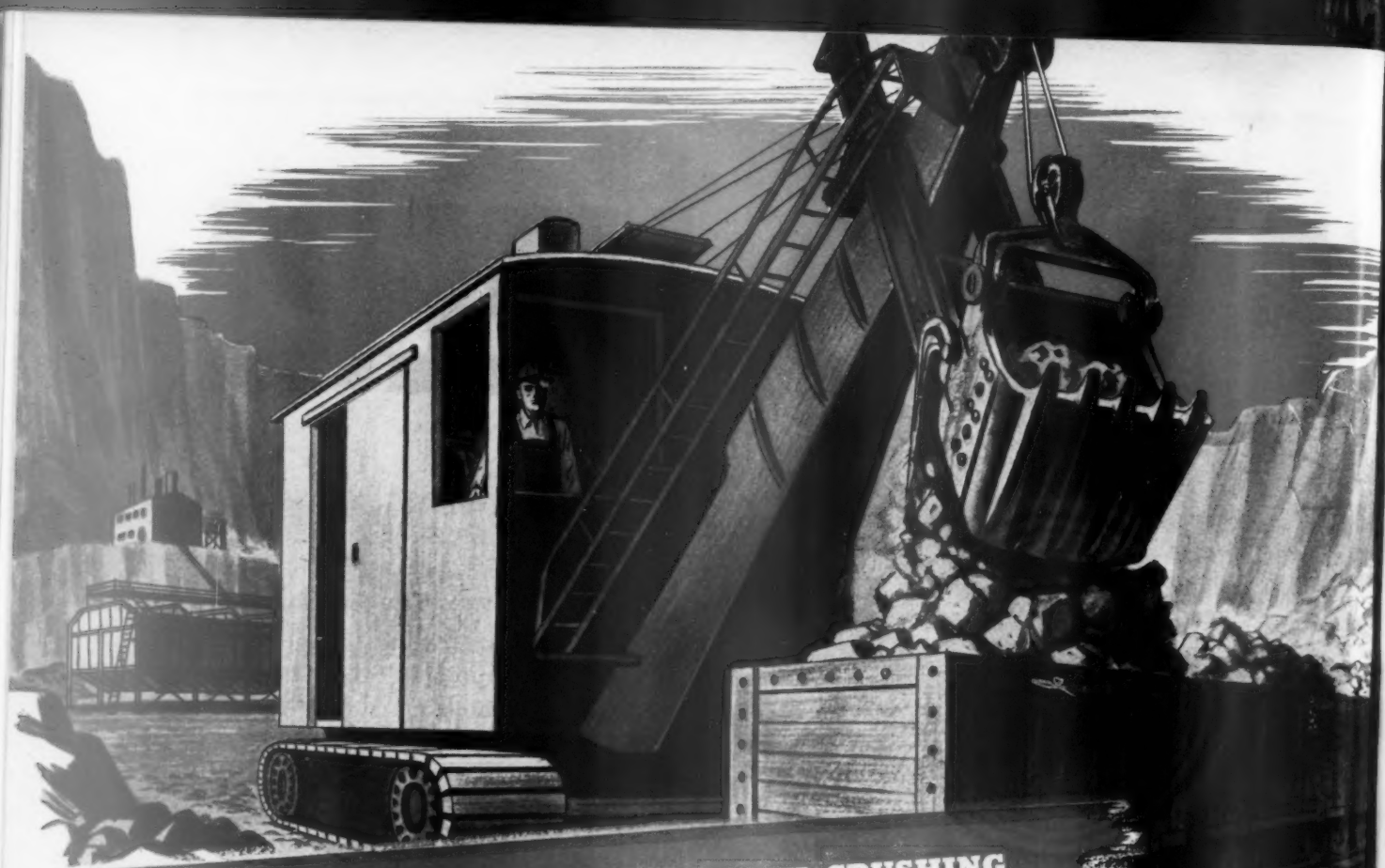
You get dependable, on-the-job delivery service that assures you the products you need on *time*... saves costly interruptions, reduces inventory problems... relieves you of bothersome detail.

When you team up with Socony-Vacuum, expect far more than just fuels and lubricants. You'll get *complete service*—down-to-earth, practical help with every maintenance headache on the job!

"ON YOUR STAFF—BUT NOT ON YOUR PAYROLL"—
Your Socony-Vacuum Representative

CORRECT LUBRICATION FOR EVERY PART OF EVERY MACHINE YOU OPERATE...
PLUS
1 ENGINEERING HELP on time-losing operating problems; 2 TESTED MAINTENANCE SCHEDULES that minimize service man-hours—keep equipment on the job; 3 PROMPT, DEPENDABLE DELIVERY—a reliable, on-the-job service that eliminates inventory problems for you!

TUNE IN "INFORMATION PLEASE"—MONDAY EVENINGS, 9:30 E.W.T.—NBC



FOR HEAVY MOVING...FOR ROCK CRUSHING
Enterprise Turbocharging gives you
"HEAVY-DUTY" POWER

If you want "heavy-duty" power...power for rock crushing . . . power for heavy moving . . . power to handle shock loads . . . low-cost power . . . *then you want Enterprise Turbocharged power.*

Enterprise Turbocharging harnesses previously-wasted exhaust gases to give you *extra* power.

Diesel oil or heavy oil may be used to operate Enterprise Turbocharged power.

Before you decide on the right power for your needs, learn about Enterprise. Write Dept. R-1 for illustrated booklet explaining the many advantages of Enterprise Turbocharging.

ENTERPRISE TURBOCHARGING GIVES YOU ALL THESE BENEFITS:

1. **Turbocharging** . . . harnesses previously-wasted exhaust gases for extra power.
2. **More power** per cubic inch displacement.
3. **Lower upkeep cost**...require less service, no hand-oiling or adjustment.
4. **Lower fuel cost.**
5. **Saves space**...more power in less space.
6. **Saves weight**...more power per pound of weight.
7. Engineered for your application, by specialists in Diesel design.

Enterprise Engines—Diesel oil, heavy oil, gas—180 to 2100 HP

The Enterprise DSG-38 Diesel, rated up to 960 HP at 400 RPM . . . one of the fifteen Enterprise Turbocharged models

SINCE 1886

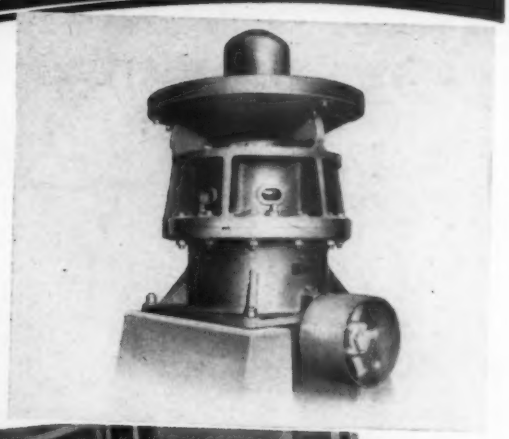
ENTERPRISE ENGINE & FOUNDRY CO.

18th & FLORIDA STREETS — SAN FRANCISCO, CALIF., U.S.A.

Cable Address "Enterfound"

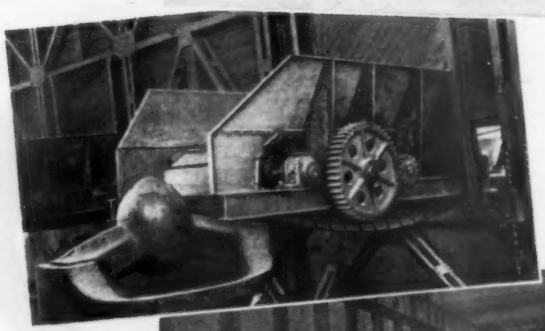
Enterprise DIESEL POWER

LIME INDUSTRY EQUIPMENT by TRAYLOR



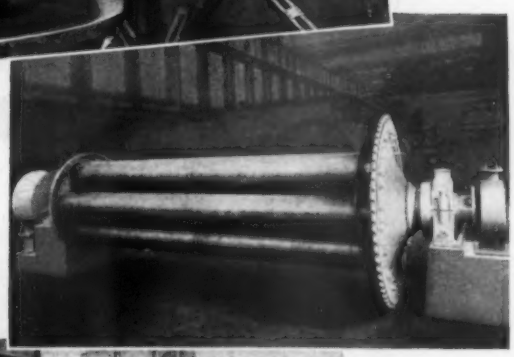
CRUSHERS

Traylor primary and secondary crushers—jaw, gyratory or roll—comprise the most extensive line on the market, from which any operator can select a complete plant for the manufacture of lime and agricultural limestone.



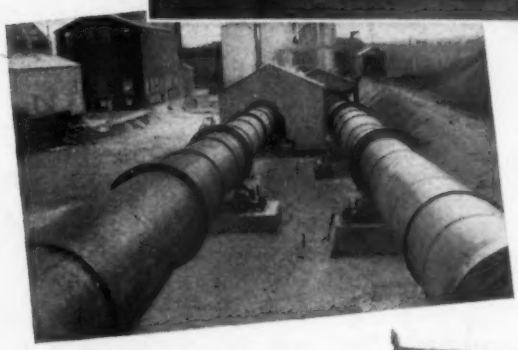
FEEDERS

Keep a steady flow of material going to the crushers, kilns, coolers, etc., with a feeder. There is a Traylor to fit your needs. These machines will help any operator get maximum production at all times.



COOLERS and DRYERS

Producing steadily and efficiently in many lime plants throughout the country are Traylor Multitube Coolers and Dryers, into which are built many exclusive patented features which make them outstanding in their field.



ROTARY KILNS

Special features place the Traylor Rotary Kilns in a class by themselves. Some of these features are—all welded steel shells; single roller supports; a new type combustion control for increased fuel economy. Made in sizes to best fit the operator's needs, Traylor Kilns are producing efficiently in many lime plants.

WE ALSO BUILD

Hot Lime Conveyors
Stone Scrubbers
Tube, Ball-Tube and Pebble Grinding Mills

WRITE FOR BULLETINS

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ENGINEERING & MANUFACTURING CO.
MAIN OFFICE AND WORKS — ALLENTOWN, PENNA., U.S.A.

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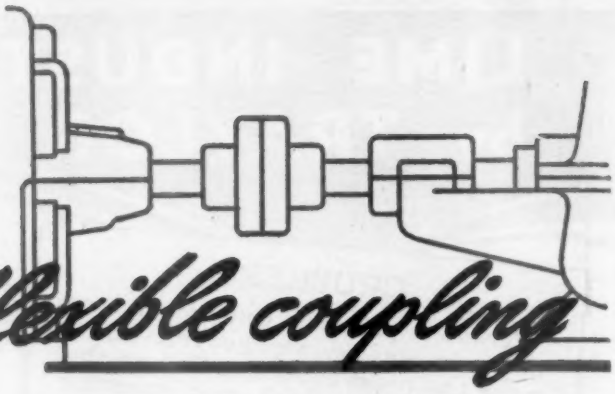
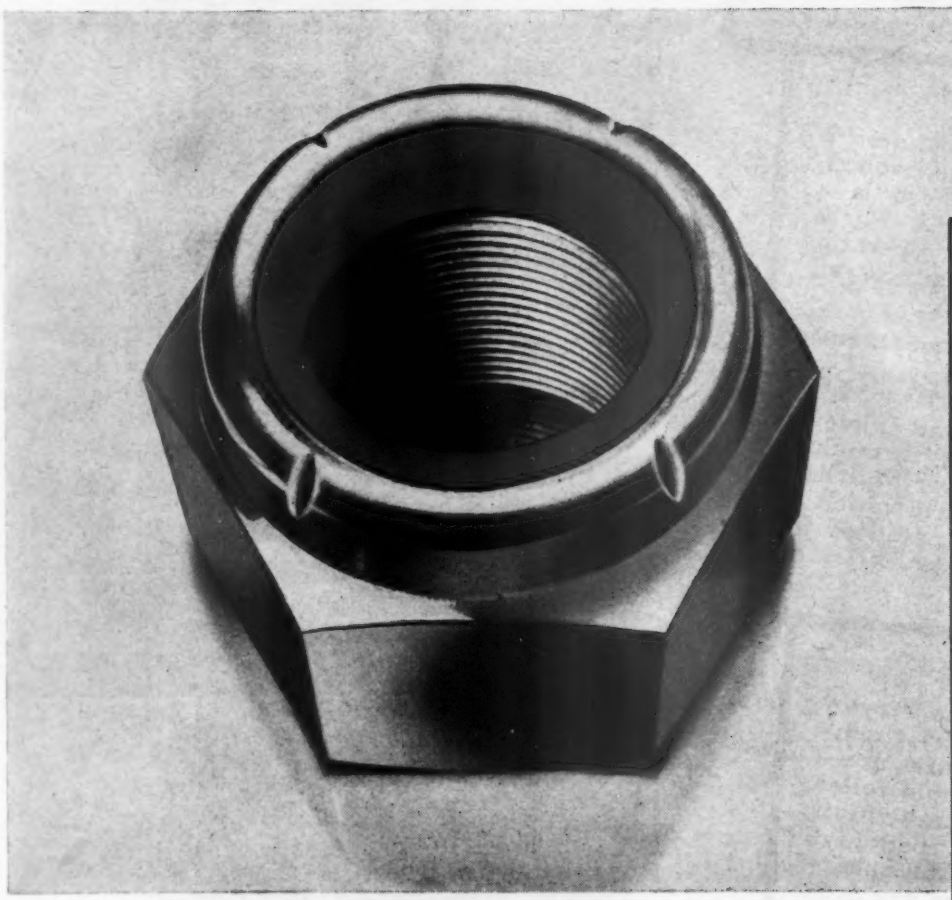
551 Howe St., Vancouver, B. C.

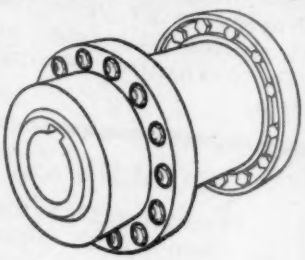
Export Department—104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, Rio de Janeiro, Buenos Aires, Santiago, Antofagasta, Oruro, Montevideo, La Paz

IT'S THE NATURAL THING

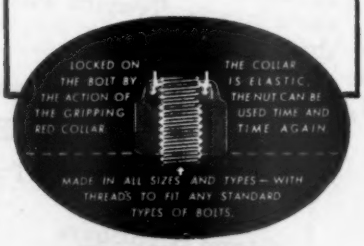


— for a flexible coupling





ESNA recommends Elastic Stop Nuts for both alignment and flexible alignment couplings that operate under conditions of vibration, impact, shock or stress reversal. Let us send an application engineer to discuss the Elastic Stop Nut way of avoiding possible nut failures on your flexible couplings—failures that may cause costly shutdowns or damage to equipment.


LOCKED ON THE BOLT BY THE ACTION OF THE GRIPPING RED COLLAR
THE COLLAR IS ELASTIC. THE NUT CAN BE USED TIME AND TIME AGAIN
MADE IN ALL SIZES AND TYPES — WITH THREADS TO FIT ANY STANDARD TYPES OF BOLTS

The Elastic Stop Nut uses its head. It has what it takes to stay put in a coupling, no matter how tough the operating conditions.

Built into the head of every Elastic Stop Nut is a locking device — an elastic compression collar.

This collar forms itself to the individual bolt thread, grips it tight. The nut won't loosen up or back off under conditions of severe vibration, shock or impact.

When you use Elastic Stop Nuts you need no cotter pins, no lockwashers or any other auxiliaries with their attendant increase in assembly and servicing costs. And you can turn them up to the torque you need and be sure they will stay there. No backing up or straining to find a cotter-pin hole. They can be used over and over again yet still lock. You can use them on any standard bolt.

Here is sure insurance against loose nuts which will result in reduced coupling maintenance costs.

ESNA
TRADE MARK OF
ELASTIC STOP NUT CORPORATION OF AMERICA
Union, New Jersey
and Lincoln, Neb.
Sales Office—1060 Broad St., Newark 2, N.J.

ELASTIC STOP NUTS
Lock Fast to Make Things Last

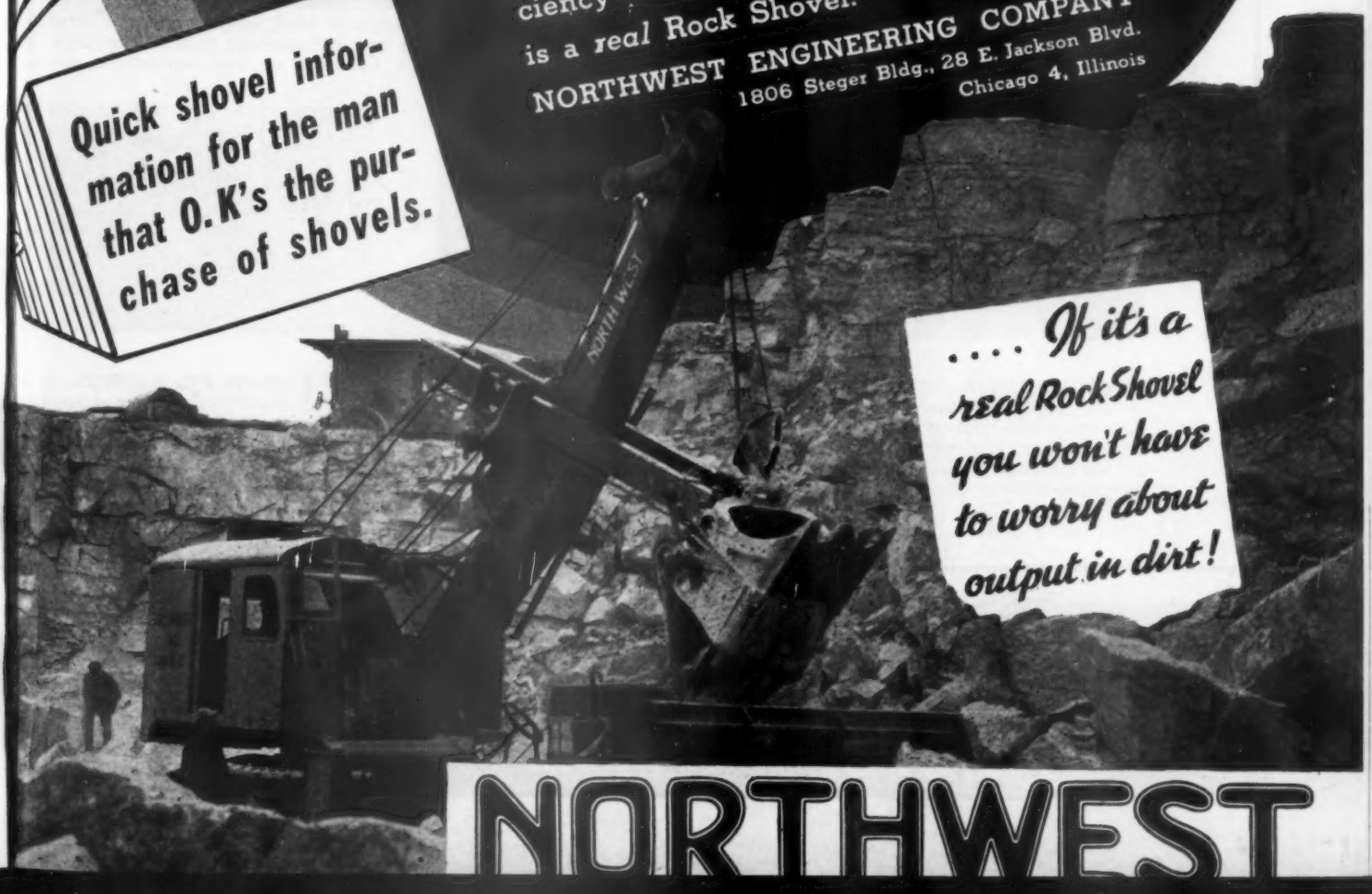
for Smooth Running and FULL POWER!

SELF aligning ball and roller bearings on all high speed shafts were first made a part of shovel design by Northwest and have *always* been standard equipment on Northwest Shovels, Cranes and Draglines.

In Northwest design lies the assurance of the minimum in friction losses and the maximum delivery of power to the dipper lip. This is only one of the many advantages that Northwest has pioneered and developed to the highest stage of efficiency — another reason why Northwest is a *real* Rock Shovel.

NORTHWEST ENGINEERING COMPANY
1806 Steger Bldg., 28 E. Jackson Blvd.
Chicago 4, Illinois

Quick shovel information for the man that O.K's the purchase of shovels.



.... If it's a real Rock Shovel you won't have to worry about output in dirt!

NORTHWEST

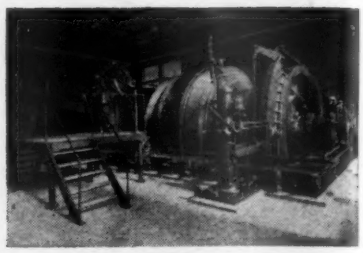
It's like "Tinker to

ALLIS-CHALMERS GIVES YOU "MACHINE TEAMWORK" — because it builds *many types* of equipment for you to select from in teaming up machines to best advantage in your plant!

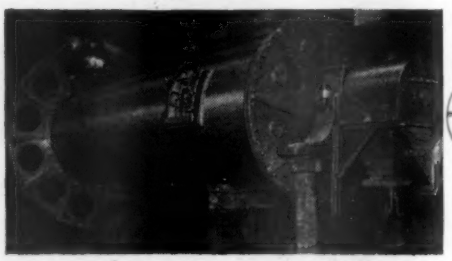
BOILED DOWN to its simplest terms, "Tinker to Evers to Chance" was the *right* shortstop to the *right* second bagger to the *right* man at first. Similarly, a smooth-flowing operation in mining or processing industries may amount to the *right* primary crusher to the *right* screen to the *right* secondary crusher. Often, getting *exactly* the right equipment for a given spot depends on having a wide choice of machines to select from — such as A-C offers you.

If *you* have a problem you want solved, or are contemplating installing new equipment, let Allis-Chalmers help you. Contact our nearby district office, or write direct to ALLIS-CHALMERS, MILWAUKEE 1, WIS.

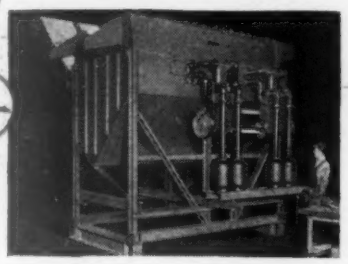
A 1786-C



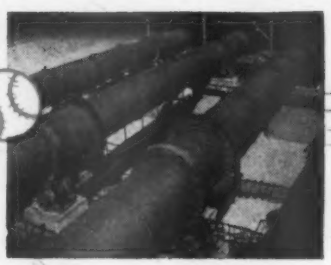
1 A-C MINE HOISTS, ranging in size from medium to the largest built, are operating on slopes, and over shafts extending more than a mile deep. When equipped with "Regulex" exciter control, voltage can be controlled automatically, assuring uniform acceleration.



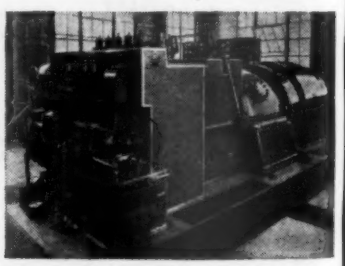
8 GRINDING. More than 3700 A-C Cylindrical Grinding mills are giving better grinding at lower cost all over the world. Over 50 kinds developed — batch, simple overflow, controlled pulp level and screening types — charged with balls, Concavex, or with non-metallic media.



9 CONCENTRATION. A-C engineers and supplies all types of concention equipment—gravity and flotation machines. Pictured above is a 24″ x 60″ Conset Jig featuring new design improvements.



10 PYRO-PROCESSING. Trend is toward *centralized instrument control* embodied in A-C kilns and coolers, reflected in design of dryers, roasters, furnaces, converters and auxiliary equipment.



11 POWER AND ELECTRICAL. A-C builds both steam and hydraulic power plant equipment, turbines, generators, etc. . . . also transformers, motor-generators, switchgear, circuit breakers, substations, etc.

WE WORK FOR VICTORY — WE PLAN FOR PEACE

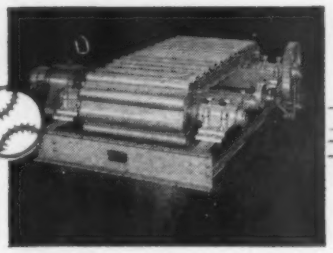
BASIC EQUIPMENT FOR CRUSHING & MINING INDUSTRIES:

ALLIS

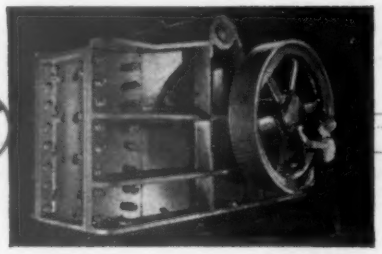
Jaw, Gyratory, Hammer & Roll Crushers, Ball & Rod Mills

Kilns, Coolers, Roasters, Dryers

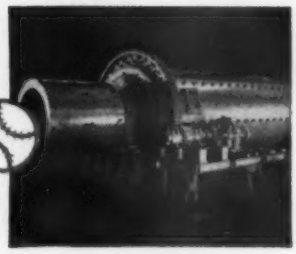
Evers to Chance"...



2 FEEDING. A-C builds a complete line of vibrating and apron feeders and conveyors for handling any size material from reagents to heavy ore tonnages — horizontally, down or up hill.

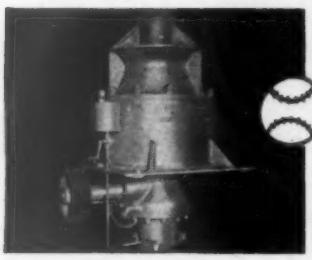


3 PRIMARY CRUSHING. Allis-Chalmers builds Jaw, Gyratory, Roll and Hammer type primary crushers. Jaw type pictured features large receiving opening for blocky feed. Available with non-choking or straight jaw plates.



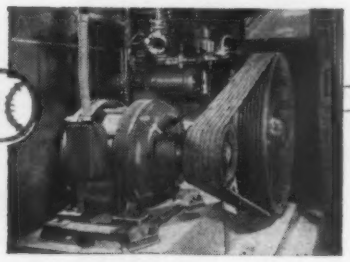
4 WASHING. A-C offers you 7 *different* types: Blade Mills, Revolving Scrubbers, Mill Type Scrubbers, Screw and Log Washers, Rotary Scrubber and Vibrating Screens.

7 MEDIUM SCREENING. "Ripl-Flo" is one of several screens A-C recommends. A 2-bearing screen, it is low in initial cost, low in power requirement and maintenance. Sizes from 3′ x 8′ to 6′ x 16′ — 1, 2 or 3 decks.



6 SECONDARY CRUSHING. A-C's Type "R" Crusher features *exclusive* "Speed Set Control" for quick change of product size — gives you close, *instant* product control!

5 COARSE SIZING. A-C builds 4 *different* coarse sizing screens. Pictured is heavy design Style "B" screen. Available in sizes 3′ x 6′ to 5′ x 14′ — with 1, 2, or 3 decks.



12 MOTORS AND DRIVES. A-C, originator of the multiple V-belt drive, is America's *only* builder of *both* motors and V-belt drives . . . offers you invaluable "know-how" in teaming them up.

13 PUMPS, BLOWERS, COMPRESSORS. A-C builds Centrifugal Pumps in capacities from 10 to 150,000 gpm, heads to 2500 lbs — also a full line of Blowers, Compressors, Vacuum Pumps.

14 FOR A QUICK PICTURE of the *entire* broad range of equipment A-C builds for the Metal and Non-Metallic industries, send for Bulletin B6166C. This *new* bulletin will prove a handy reference for your files.

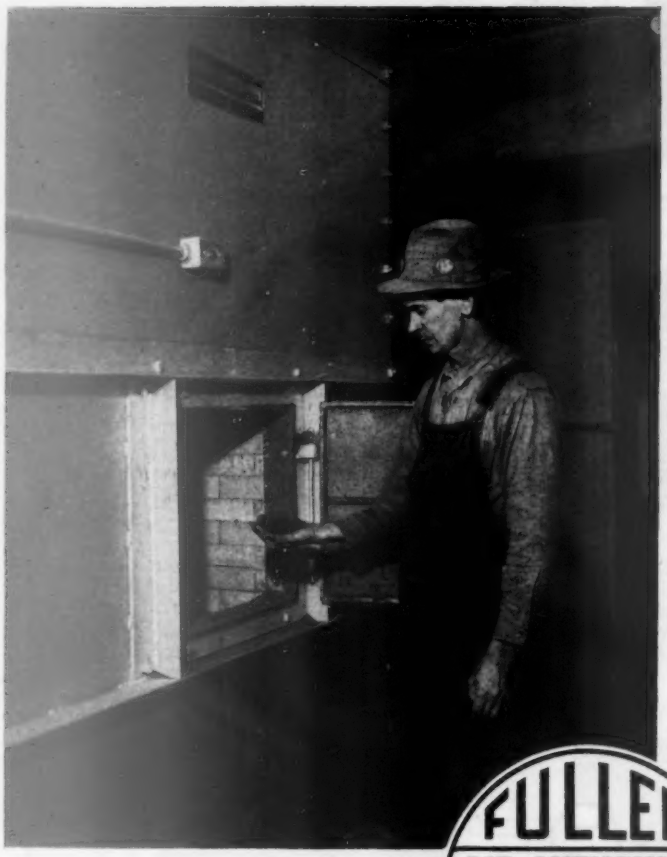
CHALMERS

Vibrating & Revolving Screens, Feeders, Conveyors, Hoists

Washers, Scrubbers, Blade Mills, Centrifugal Pumps

Tractors, Gasoline Power Units, etc.

Motors, Texrope Drives, Power Equipment



Users put their OK on FULLER COOLERS

Up to the present time over 100 Fuller Air-Quenching Inclined-Grate Coolers have been sold, most of which have been put into successful operation. Of this number 40 have been repeat orders, proving that Fuller Coolers have been all that was claimed for them. In fact, many installations have exceeded expected performance. Users have really put their stamp of approval on this equipment.

We are now in position to work with you on any clinker cooling problems you may have. No obligation on your part.

FULLER AIR-QUENCHING INCLINED-GRATE COOLER

FULLER COMPANY

CATASAUQUA, PENNSYLVANIA

Chicago 3 : 1144 Marquette Bldg.
San Francisco 4 : 421 Chancery Bldg.
Washington 5, D. C. : 618 Colorado Bldg.

Fuller Cooler installed in a cement plant. Capacity 2200 barrels per day. Clinker delivered to cooler at 2500 deg. F. and reduced in the final cooling section to approximately 150 deg. F. Fuel oil is used for burning of clinker.

Six coolers installed for cooling Portland cement clinker. Five coolers, each having a capacity of 850 barrels and one having a capacity of 1200 barrels per day, reduce clinker temperatures from approximately 2500 deg. F. to about 100 deg. F

FULLER COMPANY

FULLER-KINYON, FULLER-FLUXO AND THE AIRVEYOR CONVEYING SYSTEMS . . . ROTARY FEEDERS AND DISCHARGE GATES . . . ROTARY AIR COMPRESSORS AND VACUUM PUMPS . . . AIR-QUENCHING INCLINED-GRATE COOLERS . . . DRY PULVERIZED-MATERIAL COOLER . . . AERATION UNITS . . . MATERIAL-LEVEL INDICATORS . . . MOTION SAFETY SWITCH . . . SLURRY VALVES . . . SAMPLERS

CO-16

SURE, WILLIE CAN SPELL b-u-t-a-d-i-e-n-e

And chances are he'll tell you it's converted from petroleum into one of the primary ingredients of most synthetic rubber . . . for his juvenile curiosity knows no bounds.

Neither does the scientific curiosity of Hewitt's rubber engineers. That curiosity led to the development, way back in 1931—fourteen years ago—of SYNTHETIC rubber compounds for certain needs . . . such as oil and gasoline hose . . . where natural, tree-grown rubber just would not hold up.

YOU profit by Hewitt's *fourteen years* of experience with not one, but *many* different types of synthetic rubber. It is your "best bet" that Hewitt products will *do* your job . . . do it BETTER . . . do it LONGER . . . COST LESS per working hour.

★ ★ ★

Specify "Hewitt" for quality industrial rubber products. Phone the Hewitt distributor listed in the Classified Section of your telephone directory . . . or write Hewitt Rubber Corporation, 240 Kensington Avenue, Buffalo 5, New York.

HEWITT RUBBER *of Buffalo*

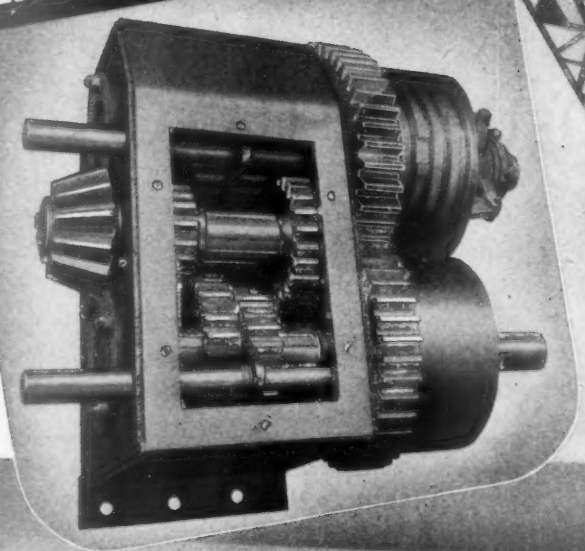
Job-Engineered Industrial Hose • Belts • Molded Goods

QUALITY RUBBER PRODUCTS FOR INDUSTRY FOR 85 YEARS

MAJOR ASSEMBLIES QUICKLY REMOVABLE

205
HALF-YARD

UNIT CONSTRUCTION
FOR
EASY ACCESSIBILITY



● Major machinery units on the new Koehring 205 are quickly and easily removed. No need to disconnect other assemblies when only the drumshaft, or the boom hoist, or the traction gear case, needs attention. Lift out only the part you want for convenient bench work. For major overhauls, the entire machinery support frame lifts off . . . as a unit . . . with all the machinery that's attached to it.

Typical of the quickly removable major machinery units of the new Koehring 205 is the independent traction unit, the assembly that makes possible the 205's independent travel while swinging, hoisting, raising or lowering the boom. The entire assembly can be lifted out without disconnecting any of the other main operating units.

KOEHRING COMPANY
MILWAUKEE 10, WISCONSIN

Orders Accepted Now for Postwar Delivery

KOEHRING HEAVY DUTY

ARMY E NAVY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

GRAVEL OR GRANITE

You can handle material speedily . . . economically . . safely with TIGER BRAND *Excellay Preformed* wire rope

LET American TIGER BRAND Wire Rope be a factor in reducing your materials-handling costs.

For example, derricks and shovels are tough on wire rope. But U·S·S American TIGER BRAND fills the bill where flexibility, abrasion resistance, and ruggedness are necessary for satisfactory service.

Actual on-the-job comparisons by engineers and operators prove its superiority. It has *greater* stamina. Is *more* flexible. *Doesn't* kink easily. *Lasts longer.* All of which means less time lost on shutdowns for repairs and replacements.

In other words, a more profitable operation for you—all the way through.

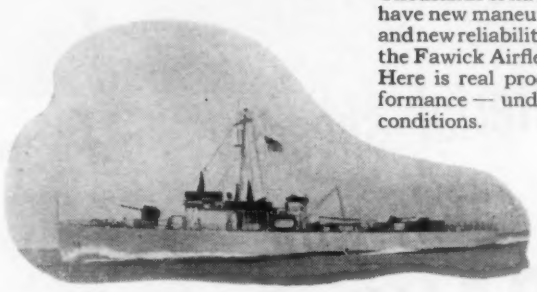
Whatever your materials-handling job, you'll find an American TIGER BRAND Wire Rope built for the purpose.

AMERICAN STEEL & WIRE COMPANY
Cleveland · Chicago · New York
COLUMBIA STEEL COMPANY
San Francisco
United States Steel Export Company, New York
UNITED STATES STEEL

U·S·S American TIGER BRAND Wire Rope

We're Looking for

Clutch Trouble



Thousands of naval vessels have new maneuverability and new reliability through the Fawick Airflex Clutch. Here is real proof of performance — under battle conditions.

Now you can equip your heavy duty machines with a clutch that is proof against trouble.

The Fawick Airflex Clutch controls torque by air. Actually, it gives you air-cushioned power. It absorbs shock and vibration, with a clutch grip as firm, or as light, as the job requires.

This revolutionary new clutch needs no arms, levers or springs. It requires no adjustments, no lubrication. It corrects automatically for misalignment. Maintenance costs are unusually low.

The Fawick Airflex Clutch has proved itself in heavy duty service—for Diesel drives, marine and industrial, presses, rubber, paper and steel mills, hoists, draglines, cranes and shovels—wherever the going is tough.

Write us for engineering recommendations based on broad clutch experience.

FAWICK AIRFLEX COMPANY, INC.
9919 Clinton Rd. • Cleveland 11, Ohio

In Canada, **Renold-Coventry Ltd., Montreal, Toronto, Vancouver**

In Britain, **Crofts Engineers, Ltd., Bradford, England**

12 Important Advantages

1. **Simple in design and operation**
2. **Flexible control by air**
3. **No adjustments or oiling — low maintenance**
4. **Dampens vibration—absorbs shocks**
5. **Corrects misalignment automatically**
6. **Smooth starting—no jerks**
7. **Runs cooler—uniform pressure**
8. **Controls torque by air pressure**
9. **Greater capacity—more compact**
10. **Remote control by air valve**
11. **Replaces flexible couplings**
12. **Acts as clutch, slip-clutch, brake and coupling**

FAWICK *Airflex* CLUTCH

POWER CONTROLLED BY AIR

It pays to be a Bemis Multiwall paper bag Customer

EVEN though direct government purchases have taken a considerable part of our multiwall paper bag production this year, Bemis customers have not suffered . . . they have been supplied on the basis of past purchases, even in the face of the labor shortage and no increase in facilities.

Naturally, the demand for Multiwalls has been greater than the supply. Much as we regret inability to fill all orders, we have felt a responsibility to take care of our regular customers first. Fortunately, we've been able to do that—and right on schedule. If it's humanly possible, we'll keep on maintaining this service.

War or peace, we want our customers to feel that it pays to be Bemis customers.

NORTH
WEST EAST
SOUTH

A major reason we've been able to supply our Multiwall customers is the size and flexibility of our production facilities.

Bemis Multiwall Plants at

PEORIA, ILL.
EAST PEPPERELL, MASS.
MOBILE, ALA.
SAN FRANCISCO, CALIF.
WILMINGTON, CALIF.
ST. HELENS, ORE.

These plants not only give us large production, but also quick accessibility to all parts of the country.

BEMIS BRO. BAG CO. Baltimore · Boston · Brooklyn · Buffalo · Charlotte · Chicago · Denver · Detroit · Houston · Indianapolis · Kansas City · Los Angeles · Louisville · Memphis · Minneapolis · New Orleans · New York City · Norfolk · Oklahoma City · Omaha · St. Louis · Salina · Salt Lake City · Seattle · Wichita

Speed and Simplicity
CUT HAULING COSTS

Rugged simplicity, always the basis of Euclid design, helps to keep hauling costs down because there is a minimum of wearing parts. Built to do one specific job... off-the-highway hauling of earth, ore, rock and coal... Rear-Dump and Bottom-Dump EUCLIDS cost less to own and operate.

With top speeds of 21.8 to 34.4 m.p.h.... carrying 15 to 30 ton payloads...Euclids move more yards or tons per day on both short and long hauls. For dependable, low-cost hauling on the toughest jobs... in mines, quarries, construction work and industrial material handling... rely on Euclid simplicity and hauling speed coupled with efficient digging and loading equipment.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

EUCLID SELF-POWERED HAULING EQUIPMENT
For EARTH ROCK COAL ORE

EUCLID THE PIONEER

Modernization with TELSMITH Steps-up Quarry Plant Output

New intermediate-crushing plant, with 16-B Telsmith Gyratory Crusher and 2-deck 4' x 12' Pulsator Screen

• War plant projects, strategic road construction, airport developments, essential municipal and state highway maintenance in the Reading, Pa. area, imposed new and heavier demands on the Berks Products Corp. rock crushing plant.

To turn out 1500 tons a day *consistently* with an increasingly larger percentage of finer sizes, called for plant modernization. But wartime restrictions meant less manpower and a minimum of new equipment. Yet maximum operating efficiency was built in by using the right Telsmith equipment.

Roundabout handling and material flow bottlenecks were eliminated by relocating the primary jaw crusher down on the quarry floor and building a new conveyor-connected screening-and-intermediate-crushing plant half-way up the incline. Its 16-B Telsmith Gyratory Crusher takes the oversize from a Telsmith 4' x 12' 2-deck Pulsator Scalping Screen located above a 125-ft. bin for 3 sizes of product.

This relieves main plant screen from coarse scalping duty, gives far better classification, and faster, more flexible secondary crushing. And, in the main plant, the installation of a No. 48 Telsmith Gyrasphere Crusher, in closed circuit with the screens, assures top tonnage of fines in all desired sizes.

Planning future modernization, expansion, or a complete new plant? Consult Telsmith engineers. Get Bulletin E-15. Q13

SMITH ENGINEERING WORKS, 504 EAST CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

51 East 42nd St. New York 17, N. Y.
211 W. Wacker Drive Chicago 6, Ill.
713 Commercial Trust Bldg. Philadelphia 2, Pa.
247 Third Street Cambridge 42, Mass.
Boehck Eqpt. Co. Milwaukee 3, Wis.
Mines Eng. & Eqpt. Co. San Francisco 4—Los Angeles 14
Brandeis M. & S. Co. Louisville 8, Ky.
Rish Equipment Co. Charleston 22, & Clarksburg, W. Va.
Rish Equipment Co. Roanoke 7, & Richmond 10, Va.
North Carolina Eqpt. Co. Raleigh and Charlotte 1, N.C.
Wilson-Weesner-Wilkinson Co. Knoxville 8, & Nashville 6, Tenn.

How RPM DELO Oil reduces engine wear

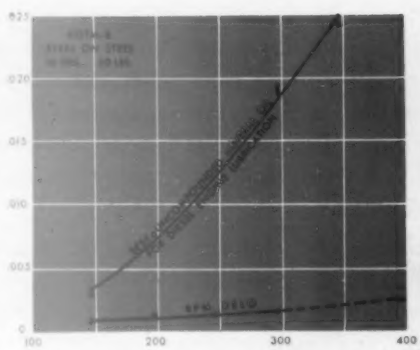
NEW PISTON RING

SCRATCHING WITH UNCOMPOUNDED MINERAL OIL

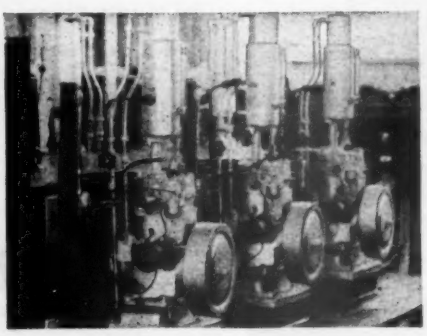
RING USED WITH RPM DELO OIL

Here is a piston used in a special break-in test with straight mineral oil. This actual photo, with scratches emphasized in red, shows how rings, lands and skirt are badly scratched.

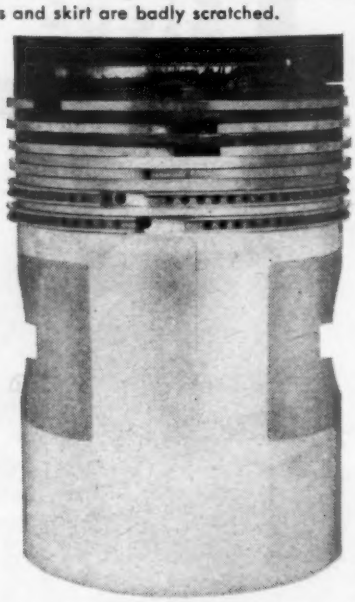
The actual photographs above, in which the lines are merely emphasized by printing in red, are typical of the results obtained when testing RPM DELO Diesel Engine Lubricating Oil against ordinary Diesel oils. Because RPM DELO Oil contains a patented metal-adhering compound, it clings to hot cylinder spots that other oils leave dry, protecting rings and liners against excessive wear.



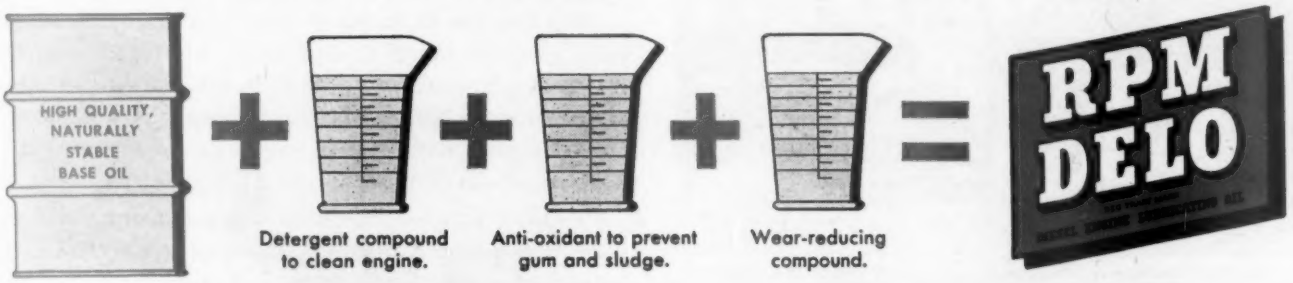
Confirming actual tests in engines are such laboratory tests as this with a Kinetic Oiliness Testing machine. RPM DELO Oil has far lower wear rate than the best uncompounded oil.



Here is a battery of special test engines in California Research Corporation's laboratories. They are used to determine the anti-ring-sticking properties of oils.



This piston went through the same test as the one above—but with RPM DELO Oil. No scratching occurred and every ring is free. RPM DELO Oil's film prevents scratching and scoring.



Detergent compound to clean engine.

Anti-oxidant to prevent gum and sludge.

Wear-reducing compound.

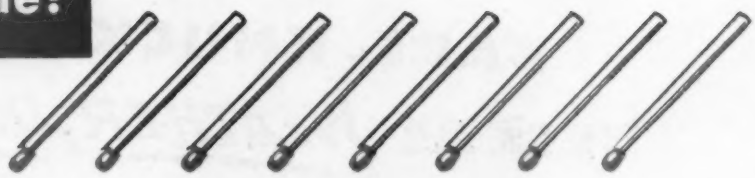
STANDARD OF CALIFORNIA

RPM DELO Oil has world-wide distribution, marketed under following names: RPM DELO, Caltex RPM DELO, Kyso RPM DELO, Signal RPM DELO, Sohio RPM DELO, Imperial RPM DELO (CONCENTRATE)

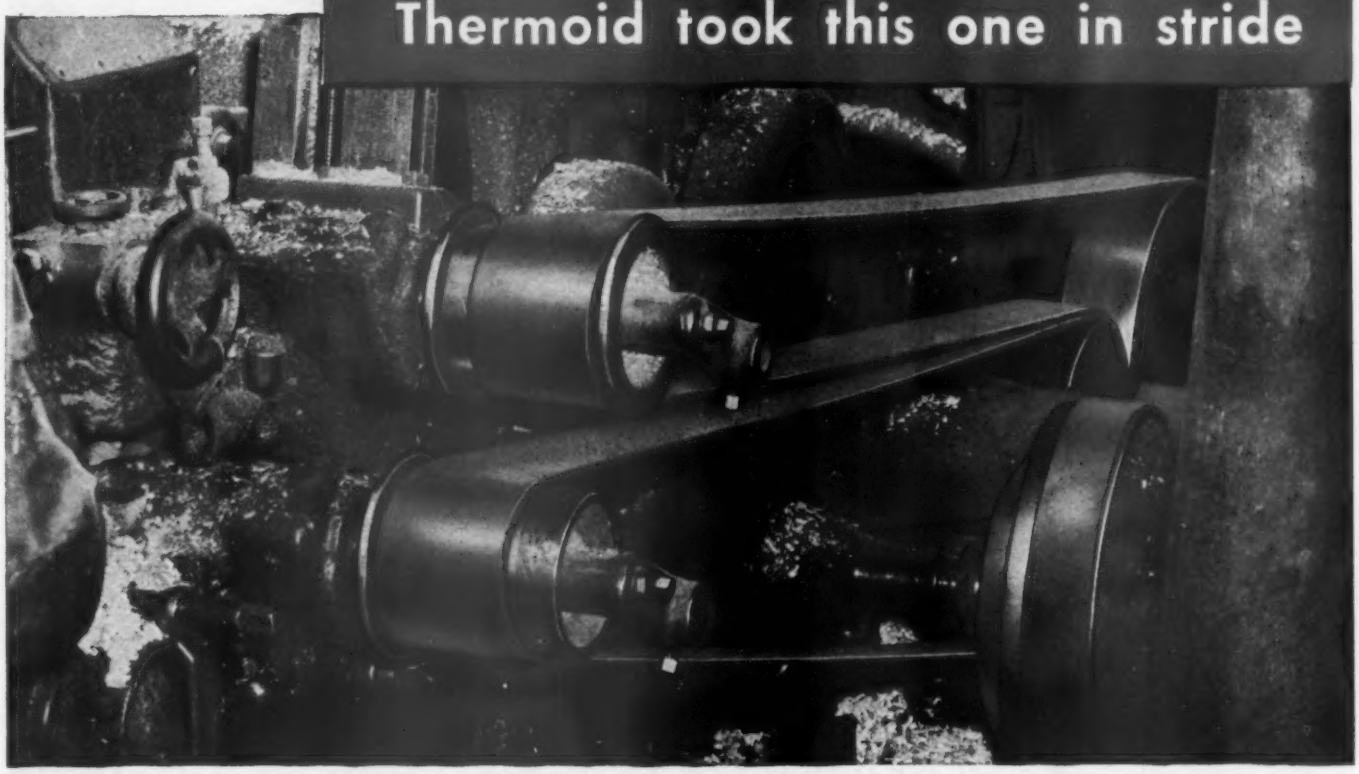
For more technical information about this revolutionary Diesel Engine lubricating oil, write to Standard of California, 225 Bush St., San Francisco 20, California, or California Commercial Co., 30 Rockefeller Plaza, New York 20, N. Y.

Can you solve this one?

Arrange eight matches to form
2 squares and 8 triangles.



Thermoid took this one in stride



In operating a top-head woodworking planer, two belts were used, each made endless with a standard make of connector. One belt was driven by a driving pulley. The second belt derived its power from contact with the first belt beneath it. Each belt had to maintain an *exact* length to function properly. But the belts stretched and frequent stops had to be made to shorten them. Also, a bad oil situation was present. The manufacturer appealed to Thermoid for a solution.

Thermoid recommended the use of two Thermoid non-stretch endless belts, made of Neoprene, to counteract the oil condition. Result: smoother operation, smoother product, and elimination of shut-downs for belt shortening.

The solution to this problem was comparatively easy because of having the right product to do the right job. Thermoid solves numerous problems of this type every day. If you have an industrial rubber product problem, call in the Thermoid representative. His experience, combined with Thermoid's complete line, extensive research and manufacturing facilities may give you the solution.

SOLUTION TO MATCH PUZZLE:

DON'T PUT IT OFF
'TIL TOMORROW
Buy More War Bonds Today!

"IT'S GOOD BUSINESS TO DO BUSINESS WITH THERMOID"

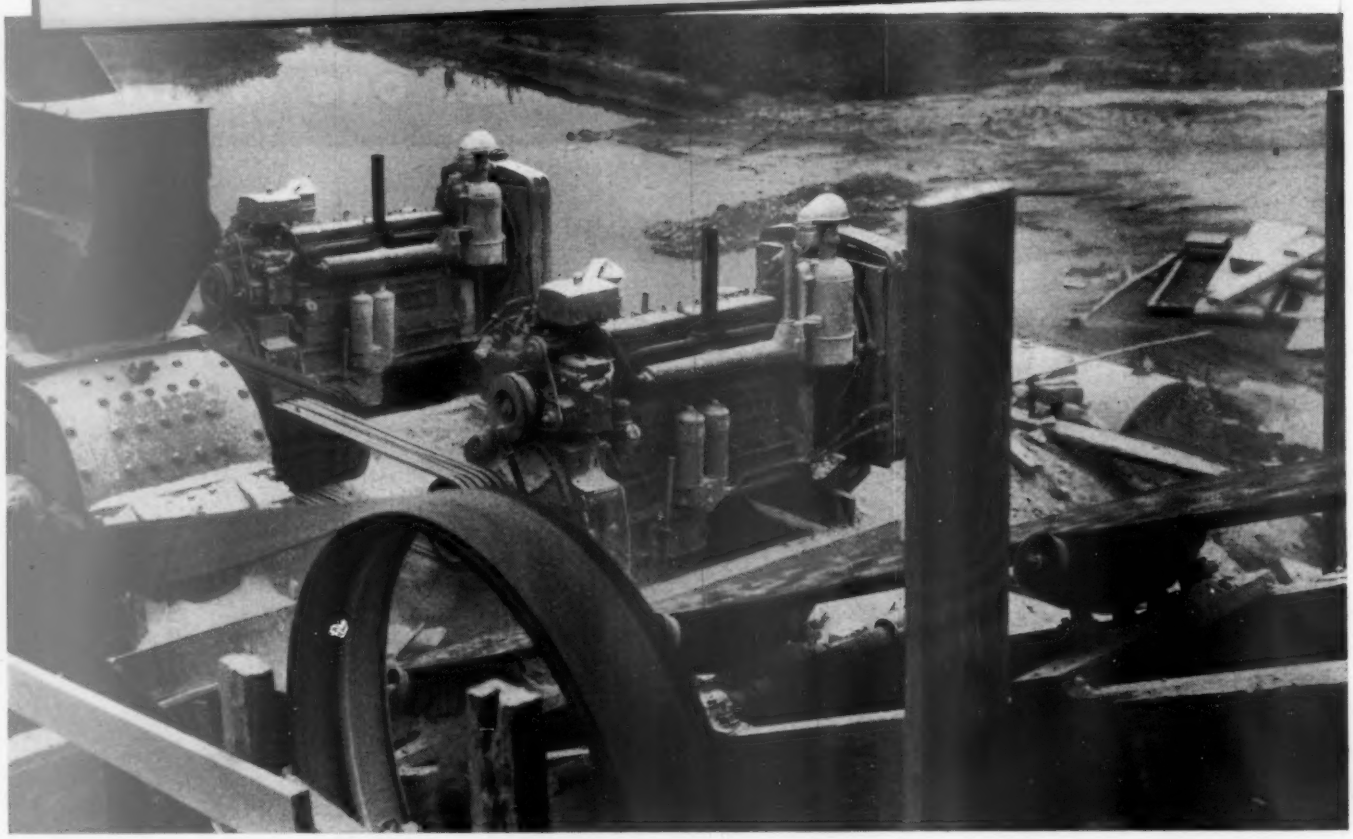
Thermoid Rubber

DIVISION OF THERMOID COMPANY
TRENTON, NEW JERSEY

THE THERMOID LINE INCLUDES:

TRANSMISSION BELTING • F. H. P. AND MULTIPLE V-BELTS AND DRIVES • CONVEYOR BELTING • ELEVATOR BELTING • SHEET PACKINGS • WRAPPED AND MOLDED HOSE • INDUSTRIAL BRAKE LININGS AND FRICTION PRODUCTS • MOLDED HARD RUBBER AND PLASTIC PRODUCTS

BARE KNUCKLE CHAMPS DEFEAT *WEATHER, DUST* AND *GRIT*



FOR evidence of the punishment "Caterpillar" Diesel Engines can take while dishing out their own wallops day after day, week in and week out, you ought to see this crusher set-up! Out in the open—without hoods—exposed to all kinds of weather—fighting clouds of limestone dust—the two "Caterpillar" Diesel D4600's you see in the picture drive a Gruendler hammermill and conveyor system with but little attention beyond the usual air-filter cleaning and lubrication servicing. (Another "Caterpillar" Diesel, not shown, drives an Iowa jaw crusher.)

Between 500 and 600 yards of lime and rock roll through the plant per 10-hour day.

PROTECTED AT EVERY POINT

"Caterpillar" Diesels are the ideal engines for the grueling work of rock crushing, quarrying, gravel screening and mining. Besides being rugged and powerful, they are so thoroughly protected with dust seals and air, oil and fuel filters that it is next to impossible for dust, dirt and grit to reach these engines' vital parts.

Their decisive fuel economy is another outstanding feature that will help make "Caterpillar" Diesel Engines your choice, as they have thousands of other enthusiastic owners.

DO YOU NEED A NEW "CATERPILLAR" DIESEL?

Quarry men who have been wishing for one of these famous engines can get in line to have their wishes granted. For many months, the war has taken most of the "Caterpillar" factory's output. If you'd like to be among the early owners of a brand-new "Caterpillar" Diesel, the thing to do is to see your dealer and sign up for one NOW.

Caterpillar Tractor Co., Peoria, Illinois

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

WHICH OF THESE MATERIALS DO YOU LOAD?

IF you load any of these materials — **GRAVEL EARTH • CRUSHED ROCK • SAND • ORE SNOW • COAL**—look into the many merits of Athey MobiLoaders.

These fast-working loading tools, mounted on "Caterpillar" Diesel Tractors, are turning in outstanding records of production and low costs. Using the overhead loading principle, they're moving all kinds of materials faster, boosting output on every loading job.

Ask your Athey "Caterpillar" Dealer about delivery on an Athey MobiLoader. In the meantime, write for new descriptive folders.

New, Picture Folders On Athey MobiLoaders

Write Athey Truss Wheel Company, 5631 West 65th Street, Chicago 38, Illinois for Folders 444 and 445.

Athey

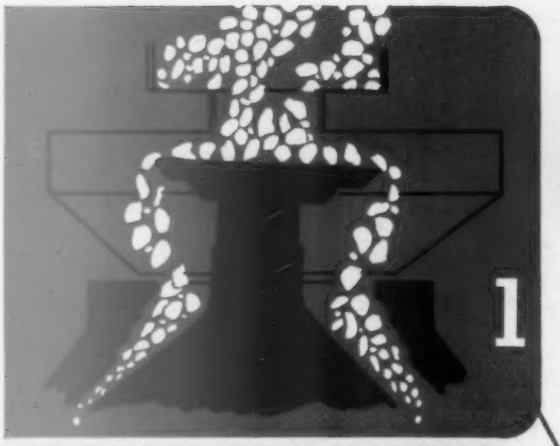
MOBiLOADERS

Loading rock into trucks on the Tacoma and Seattle, Washington Airport, this Athey MobiLoader speeds loading jobs for the Northwest Construction Company.

Sub-grading and loading earth at the rate of 90 cubic yards per hour with Athey MobiLoader. Owned by Columbia Bitulithic, Ltd., Vancouver, B. C.

This versatile Athey MobiLoader is loading from a compacted gravel embankment in a county quarry near Paragould, Ark. Loading 4 yd trucks in less than 2 min.

Crushed rock is quickly handled by this big-capacity Athey Model 8 MobiLoader on railroad grade building near Shelton, Washington for General Construction Co.



4 reasons why the CONE leads in the fine crushing field . . .

1 uniform controlled feed

Feed platform with adjustable spout in conjunction with the oscillating feed plate combine to control and uniformly distribute the feed to the crushing cavity.

2 maximum liner utilization

With the Symons process of crushing, the crushing action occurs throughout the entire length of the cavity. Uniform manganese wear means minimum scrap loss and low manganese cost per ton of crushed product.

3 large discharge area

Wide throw of head creates a large opening for free and rapid discharge of crushed fines. This allows rapid entry of new feed into the cavity, an essential factor for big capacity.

4 protection from tramp iron

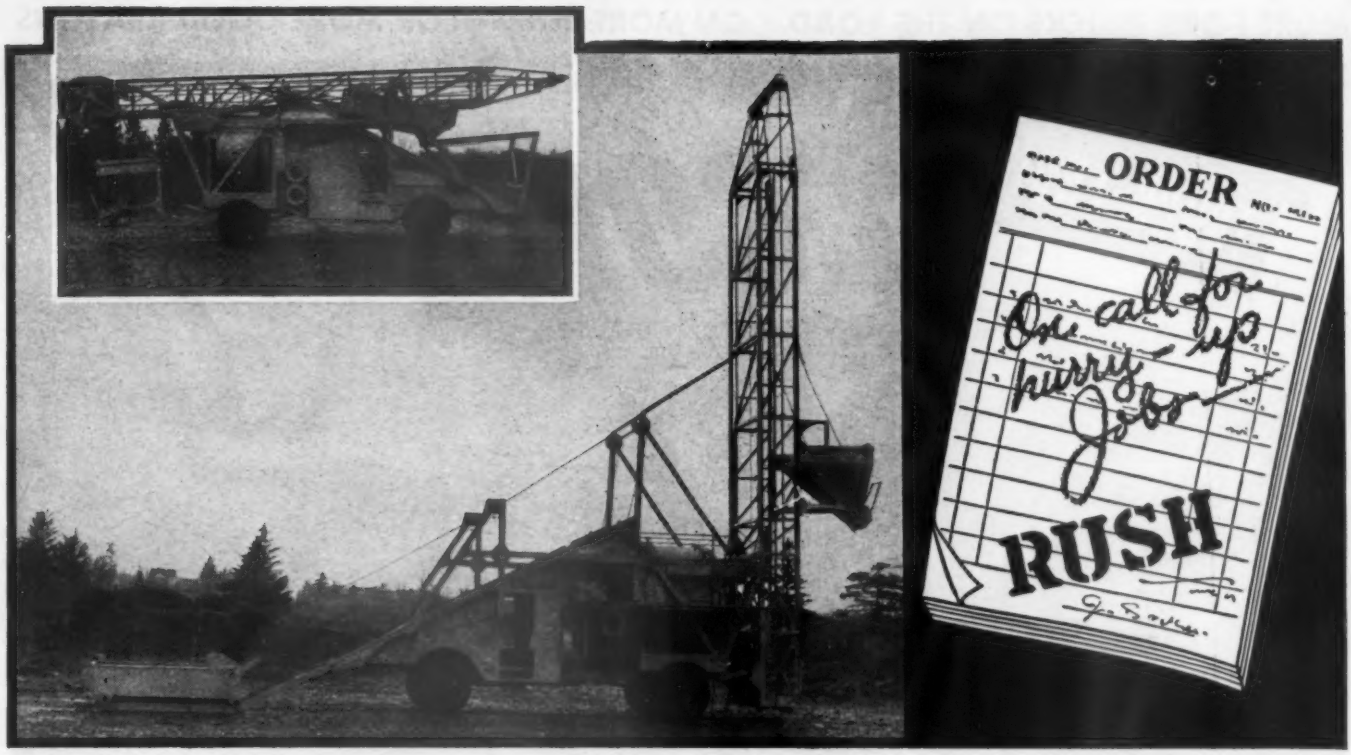
The circle of heavy springs permits the bowl and adjustment ring to rise should a non-crushable object enter the crusher. This protects the crusher from damage due to tramp iron.

These and other features found only in the Symons Cone make possible the enormous output of fine product which has won for this crusher the position of leadership in the fine crushing field.

NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN
NEW YORK • LOS ANGELES • LONDON • TORONTO

NORDBERG MACHINERY

SYMONS CONE CRUSHERS



MIXERMOBILE

SPEEDS INYOKERN PROJECT

MIXERMOBILE is a *thoroughly engineered,* portable, central-mixing plant. It was developed and perfected over a period of ten years by men who know and understand all phases of problems encountered in concrete construction.

The construction records MIXERMOBILES have made on the many critical projects throughout the United States is outstanding. MIXERMOBILES have mixed and poured upward to 55 yards of concrete an hour at a low operating and maintenance cost.

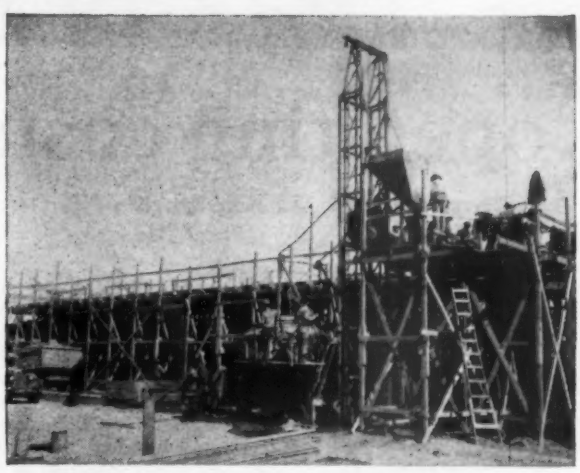
TIMED MIXING: A patented timer, exclusive with MIXERMOBILE, can be set for *any* mixing time. The timer contains an automatic batch counter as well.

CONTINUOUS POURING: MIXERMOBILES furnish concrete to the contractor at the hopper spout *continuously.* The drum is always loaded with the next batch ready for pouring.

SPEED: MIXERMOBILES load, mix, hoist and pour concrete with speed and efficiency. A standard MIXERMOBILE can mix and pour 45 yards of specified concrete an hour.

MOBILITY: Moves from job to job as rapidly as a truck. Makes various setups on the same job in a few minutes. Complete set-up accomplished in one-half hour.

HOISTING: The tower can be extended to 65 feet in height quickly and easily with 10-foot sections. No guying is required under 55 feet if the Mixermobile is on solid ground.



A typical example of MIXERMOBILE performance is the Inyokern project in California. Here several MIXERMOBILES did much to speed construction of the rocket testing grounds. Pictured above is one of the MIXERMOBILES at Inyokern, mixing and hoisting concrete for quick completion of the Navy project.

• • •

Write factory for complete details and illustrated folder.

BUGGYMOBILE
MIXERMOBILE
SCOOPMOBILE

MIXERMOBILE

• MANUFACTURERS •

6855 N. E. HALSEY STREET • • • PORTLAND 16, OREGON

MORE FORD TRUCKS ON THE ROAD • ON MORE JOBS • FOR MORE GOOD REASONS

TRUCK-ENGINEERED **Economy!**

"...operating costs very satisfactory"

—*says* Wm. L. ALLEN, *Miner of Plastic Fire Clay*
Laurel, Md.

"I now have three Ford Trucks in service, delivering Allen Plastic Fire Clay to Bethlehem Steel Plant, Sparrows Pt., Md. These trucks are doing a good job—holding up well and making their two trips a day on this forty-mile haul for the last three years. The general operating costs are very satisfactory. I like the Ford Truck because it is light in chassis weight, yet strong, allowing more payload."

—Wm. L. Allen

TO GET your loads from where they are to where you want them, for the least money, with the utmost sureness and promptness, is the main reason why you buy trucks, isn't it?

That's the basis of Ford Truck engineering. There's a proper Ford Truck for 95 per cent of all hauling jobs. Whether your hauls are long or short, off-the-road or on the concrete, over tough grades or on the level, one of the 126 Ford Truck combinations is practically certain to fit your needs. It will have the right kind of power and plenty of it, giving you ample engine torque over a wide range of road speeds. It will have a chassis more massive and sturdy than comparable trucks—*truck-engineered* for your needs.

It will have what's needed for economical operation and maintenance. It's because of Ford truck engineering that more operators use Ford Trucks than those of any other make.

Under government allocation, present production of Ford Trucks is necessarily limited as to types, equipment and quantities for essential civilian needs. See your near-by Ford Truck dealer for free counsel in obtaining official certification of your requirements.

Ford

TRUE *TRUCK* ENGINEERING

Powerful truck engines—Six chassis types—for 95% of all hauling jobs.

FAMOUS FORD FEATURES

- Service ease . . . engine crankcase, transmission, clutch and other chassis units readily accessible, hence—
- Low maintenance cost.
- Universal service facilities.
- Heavy-duty front axle—massive spindles—large taper roller wheel bearings.
- Extra-sturdy full-floating rear axle—pinion straddle-mounted on 3 large roller bearings—3 axle ratios available—2-speed axle optional at extra cost.
- Powerful hydraulic brakes—exceptionally large cast drums.
- Needle bearing universal joints.
- Rugged 4-speed transmission—large roller bearings.
- Shifto-Guide speedometer dial—saves fuel—saves wear.
- All-steel comfort cab—safety glass.

FORD TRUCKS

AND COMMERCIAL CARS

TRUCK-ENGINEERED • TRUCK-BUILT • BY TRUCK MEN

PRINT IN BL

AVE MONEY WITH DOUBLE-DUTY TOURNAPULLS

Tournapull interchangeability will help increase your profits by giving you (1) extra hauling capacity during your busy season with Tournatrailer plus (2) low-cost stripping during your light production months with Carryall Scraper. Both trailing units are powered by the job-proved 150 h.p. Tournapull prime mover. Both are cable operated from the same LeTourneau Power Control Unit, mounted at the rear of the Tournapull, and are quickly and easily interchanged.

This lowers equipment investment by distributing the cost of the Tournapull prime mover over many of your pit and quarry operations. No expensive one-purpose rigs stand idle during your off seasons.

If you are using old specialized equipment for your stripping and materials hauling, it will pay you to let your LeTourneau distributor show you how interchangeable Tournapulls can help you move more yardage faster, at lower cost with fewer units and men. See him TODAY.

PQ2

TOURNATRAILER for rock-shovel loading

For your rock or aggregate hauling, consider these Tournatrailer advantages:

1. One spot takes approximately 20 tons of rock away from the shovel.

2. Overall height of 8', with 8' x 12' 8" top opening speeds shovel loading.

3. Hauls at 14.9 m.p.h. in high gear, plus plenty of power to get into high quickly and climb quarry grades easily.

4. Load rides between big 21.00 x 24 tires; no spring maintenance. No overloading of tires on uneven ground nor wedged-rock damage as with duals.

5. To dump, cable-controlled trailer body slides back, cleans load off bed, out the rear, clear of tires. By opening slowly, material can be spread as you move forward.

CARRYALL SCRAPER for stripping and handling gravel

For lower cost stripping and gravel production, Tournapull-powered Carryall Scrapers offer you:

1. Loading, hauling or spreading in a single 15-yard unit.

2. It strips heaping loads in shallow overburden as efficiently and at the same low cost as it does on deep cuts.

3. More return from your equipment investment because Tournapull prime mover keeps earning the year 'round . . . stripping with Carryall during your light production months . . . and during your busy season handling your major hauling work with Tournatrailer.

4. On gravel operations, Tournapull-Carryall will strip the pit, load and haul gravel to the washer or screening plant, dump through grizzly.

5. For road surfacing, can load from pit or stockpile, haul and spread in place.

JOB-PROVED
Over 2800 Built and Shipped

LETOURNEAU

PEORIA, ILLINOIS . . . STOCKTON, CALIFORNIA

IN BINDING

HOW YOU PROFIT BY B G Pre-Engineering

• Here's a *factory-built* conveyor system that will fit your *custom-built* plant completely!

No special engineering. No delay for estimates on cost. No weeks of waiting for factory fabrication. Barber-Greene Conveyors are pre-engineered—pre-fabricated!

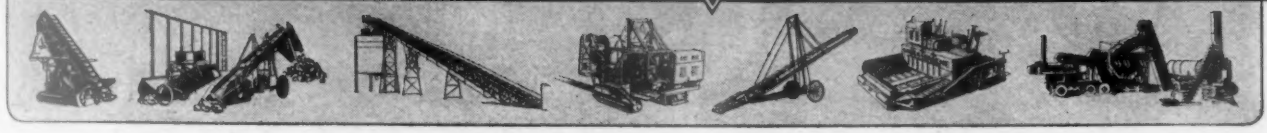
B-G Conveyors are built in a variety of sizes, forms and capacities, that they'll meet any material handling requirement . . . can be installed anywhere.

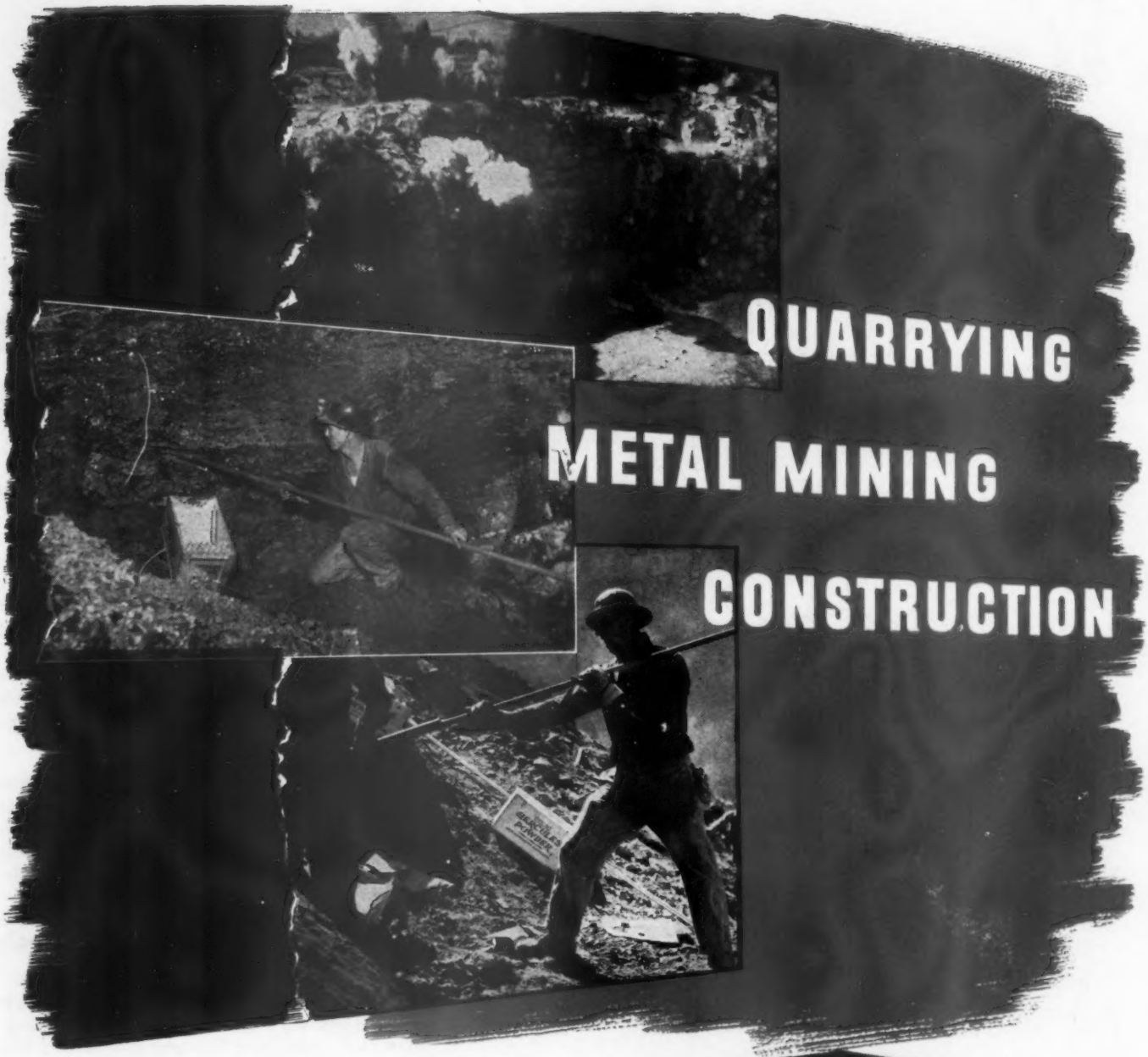
Erection costs? Your own workmen can install a B-G Conveyor system quickly, easily. Units arrive on the job conveniently marked. Factory assembled terminals and standardized units simplify and speed erection.

Barber-Greene Conveyors are *standardized*. You can make additions and alterations rapidly . . . move it to a new location with 100% salvage. Factory assembly assures correct alignment in erection—reduces belt wear and maintenance expense. Write for Catalog 76. Barber-Greene Company, Aurora, Illinois.

45-20

Barber-Greene B G *Constant Flow Equipment*





IN quarrying, construction, metal mining, users of Hercomite* and Gelamite* are currently saving 10% to 15% of powder costs compared with older types of explosives.

Whenever their use is indicated, Hercomite and Gelamite give maximum breakage for every dollar. Proof of their efficiency and economy is to be found in their widespread use, both on the surface and underground. These high-cartridge count explosives are now more popular than ever before.

Originated by Hercules, Hercomite and Gelamite are only one example of many outstanding Hercules developments in the field of explosives.

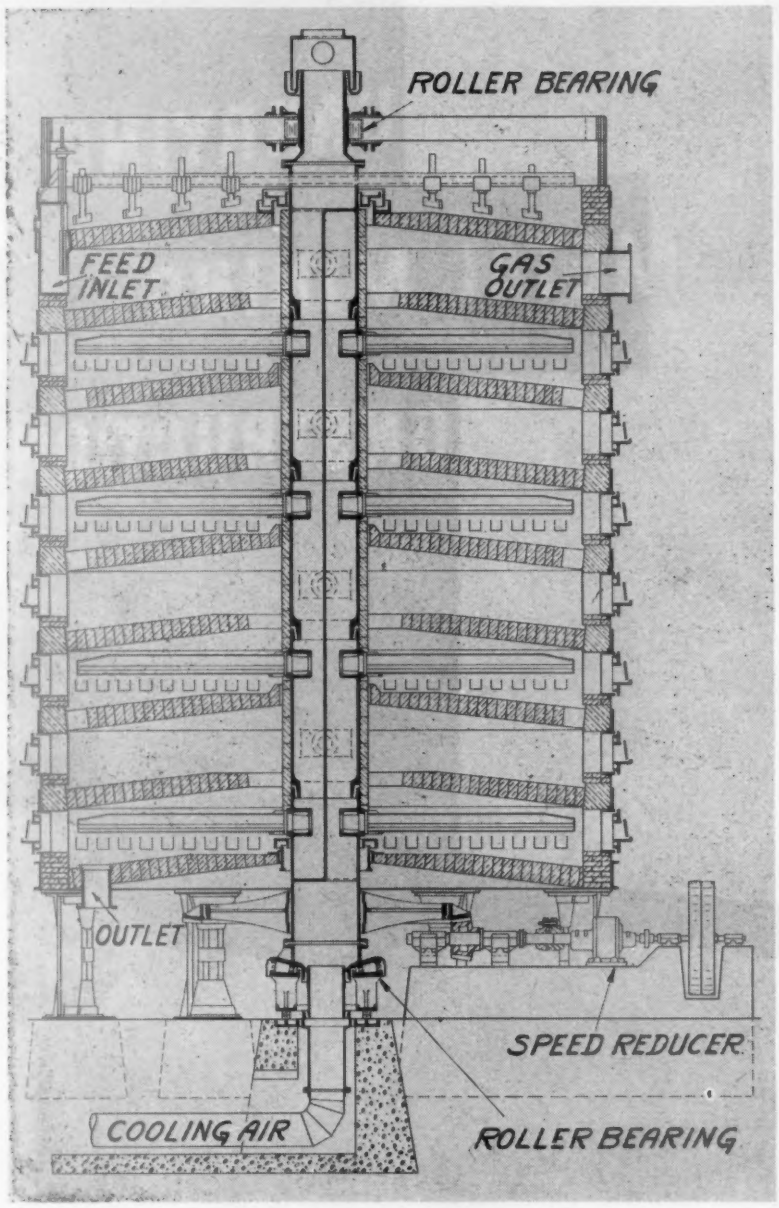
HERCULES POWDER COMPANY
INCORPORATED
960 KING STREET
WILMINGTON, DELAWARE

*Reg. U. S. Pat. Off. by Hercules Powder Company

XR-52

If you are producing AGRICULTURAL *(Hydrated)* LIME

Read this:



THE Skinner Multiple Hearth Roaster has many applications, one of which is extensive use in calcining precipitated calcium carbonate for beet sugar refineries. Chemically the latter process is identical with the calcining of limestone (3/8" to dust) to produce quicklime for hydrating.

Description and Advantages — Consists of a series of superimposed hearths encased in a rigid steel skeleton or shell. The material is rabbled over each successive hearth from top to bottom by rotating arms with teeth, all detachably fastened to a central hollow shaft. The shaft is designed for ample forced air cooling to both shaft and arms.

Shaft and arms are supported by a large specially designed roller bearing, insuring long, trouble-free operating life at any desired speed. Outer drop holes are arranged to permit cleaning from outside the furnace. Easy access to inside during operation. Simple adjustment of vertical shaft. Quick replacement of arms or teeth without cooling furnace. Coal, oil or gas fuel.

Sizes — From small 4 ft. internal diameter experimental model with 4, 6 or 8 hearths, up to 20 ft. diameter with as many as 12 hearths.

One of our engineers will gladly discuss either calcining or sand washing with you personally without obligation.

This company also manufactures the well-known Akins Classifier which has one major application in the rock products field, viz., the washing of special sands, as for foundries and glass making.

COLORADO IRON WORKS Company

Canadian Locomotive Co., Ltd., Kingston, Ont., Can.
Vancouver Iron Works, Ltd., Vancouver, B. C., Can.
Head, Wrightson & Co., Ltd., Stockton on Tees, England
Head, Wrightson & Co., (So. Africa) Ltd. Johannesburg
The Clyde Engineering Co., Ltd., Granville, N. S.W.

MAIN OFFICE & WORKS: DENVER 2, COLO., U. S. A.

OVER A MILLION TONS NOW . . . .

5 to 10 Million Predicted

This 24" 6-ply Bull Dog Conveyor Belt has already carried more than a million tons of heavy abrasive broken granite. The owners expect five to ten million tons more out of this belt.

Heavy duty conveyor operations demand

First — A quality standard in rubber and fabric content.

Second — Superb workmanship and "know how."

Third — The finest vulcanizing procedure in existence — the BWH Rotocure Process.

Wherever extremely hard conveyor belt installations are contemplated, be sure to get in touch with our nearest distributor or field technician, or write us direct.

BOSTON WOVEN HOSE & RUBBER CO.

WORKS: CAMBRIDGE, MASS., U.S.A.
P.O. BOX 1671, BOSTON, MASS., U.S.A.

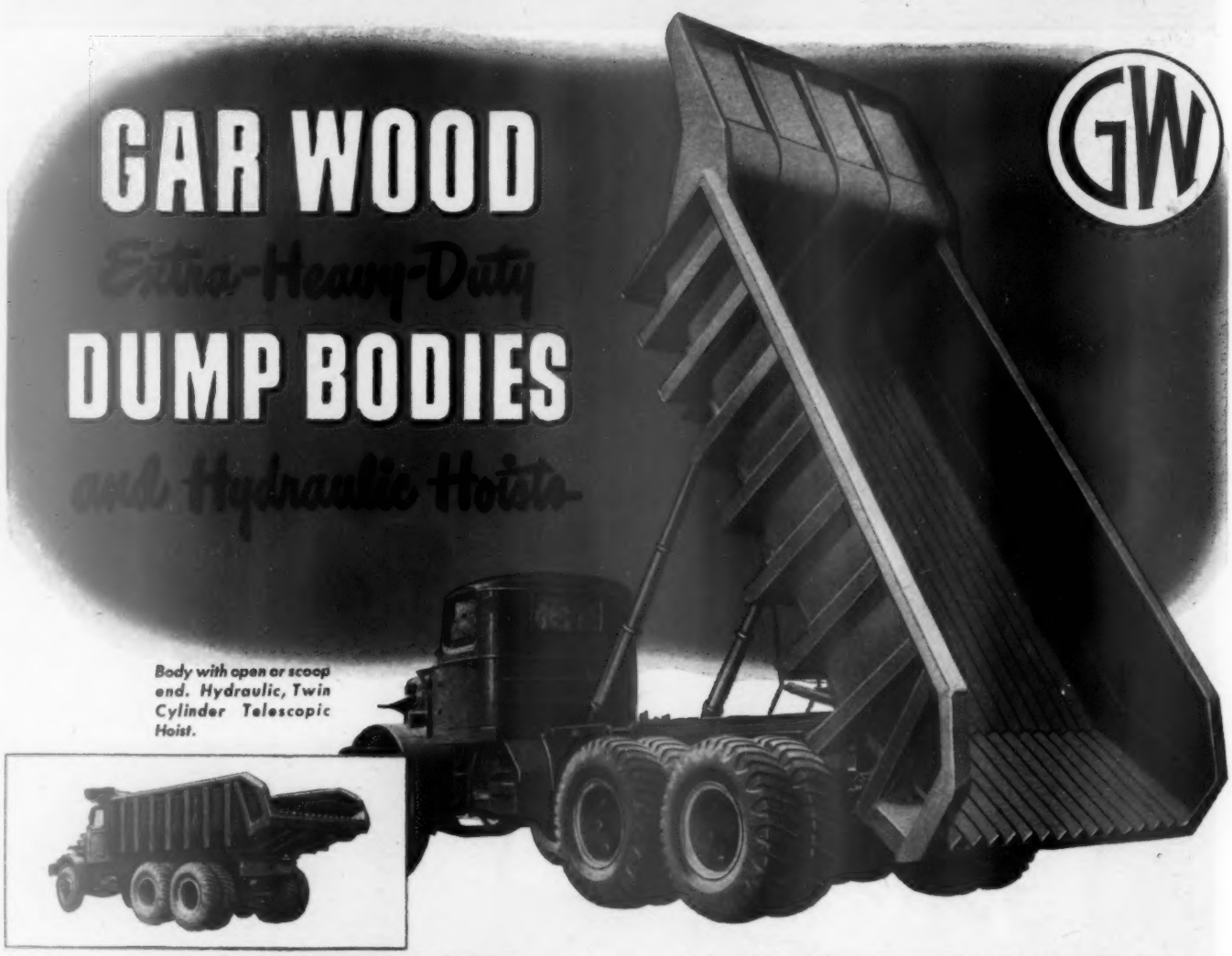
BOSTON WOVEN HOSE TRADE MARK AND RUBBER COMPANY

BIGGER LOADS . . . LOWER COST . . . GREATER PROFIT!

GAR WOOD

Extra-Heavy-Duty DUMP BODIES

and Hydraulic Hoists



Body with open or scoop end. Hydraulic, Twin Cylinder Telescopic Hoist.

Trucks equipped with Gar Wood X-112 Bodies and T-4440 Hydraulic Hoists haul BIGGER LOADS on fast schedules. This speedier handling of overburden, ore and coal means lower operating cost and greater profit for you. Remember too, when you buy "Gar Wood" you get the benefit of more than a quarter of a century of experience in building Hydraulic Hoists and Dump Bodies . . . a factor that has made this line the most popular in the field and preferred by all types of operators.

Body with automatic downfold tailgate. Gate opens as body elevates.

One-way side dump Body with Dual Hydraulic Hoist. Automatic downfolding side.

Support the 7th War Loan . BUY MORE BONDS

GAR WOOD INDUSTRIES, INC., Detroit 11, Mich.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

WINCHES AND CRANES • TANKS • ROAD MACHINERY • HEATING EQUIPMENT • MOTOR BOATS

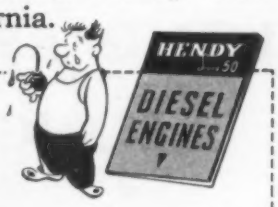
Phantom view shows lube-oil path in red

"Put DOWN that oil can, Lube-oil Reuben!"

No need to hand-oil any part of a Hendy Series 50 Diesel! It's completely enclosed, so *all* parts are oiled from the pressure-lubrication system . . . automatically . . . in correct amounts, neither too much nor too little.

Series 50 Diesels have advantages never before combined in a single design. Besides full pressure lubrication, they have overhead camshafts, unit fuel pumps and injectors, oil-cooled pistons, and many other features.

Now, for the first time, you can have the benefit of *all* these features in *one* tested and reliable Diesel. For complete information, mail the coupon today to Joshua Hendy Iron Works, Sunnyvale, California.



Send for NEW Diesel Booklet
No Obligation

JOSHUA HENDY IRON WORKS
SUNNYVALE, CALIFORNIA

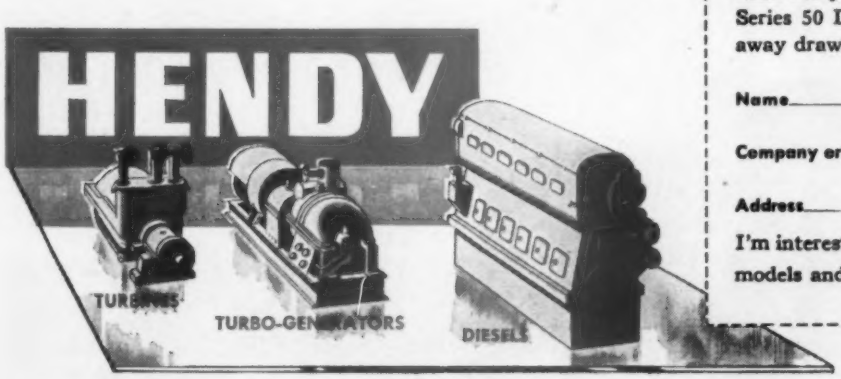
Mail me your new booklet that completely describes the Series 50 Diesel, with photographs and cross-section cut-away drawings showing the design of all major parts.

Name_____ **Position**_____

Company or business_____

Address_____

I'm interested in Marine ☐ Stationary ☐ Diesel-electric ☐
models and in hp ranges from 190-250 ☐ from 250 up ☐



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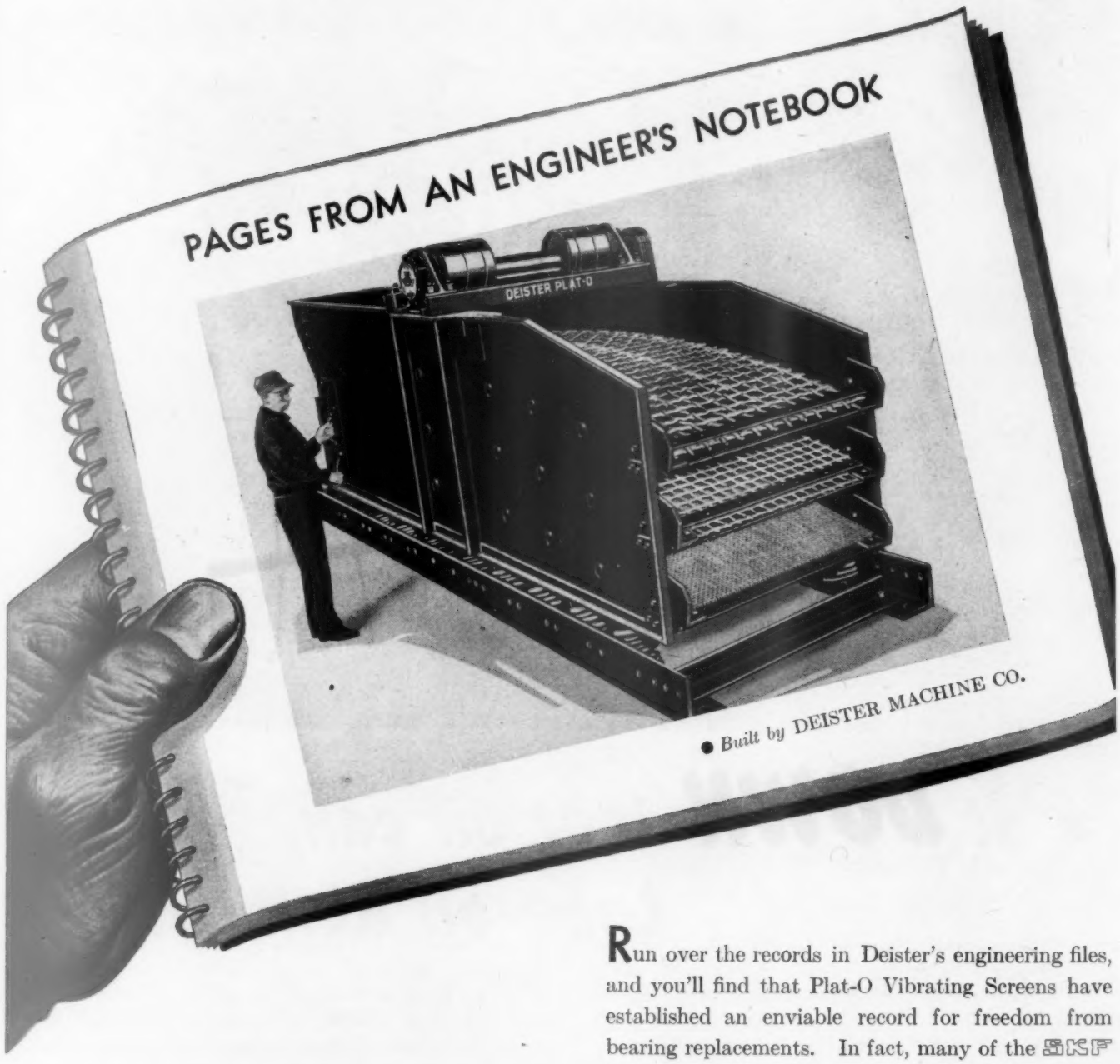

LONG BEARING LIFE = LONG SCREEN LIFE

Run over the records in Deister's engineering files, and you'll find that Plat-O Vibrating Screens have established an enviable record for freedom from bearing replacements. In fact, many of the SKF Spherical Roller Bearings on Deister machines haven't quit until after 12 long years of particularly severe service in sand and gravel plants where they're used from early Spring to late Fall—and then stand idle until the following Spring. Where durability, high-load carrying capacity and freedom from attention in a bearing leads to long, continuous service in a machine, the bearings invariably are SKF's. 5793

SKF INDUSTRIES, INC., PHILA. 34, PA.

BOILED DOWN

TO SIMPLIFY MOTOR SELECTION

● This new booklet gives ratings, sizes, characteristics, dimensions, where-to-use data, *and prices* of General Electric a-c and d-c motors, 1/16 to 75 hp. Everything you need to know to select these sizes—all in 16 pages!

Buy all the BONDS you can—*and keep all you buy*

GENERAL ELECTRIC

To Save Your Time Later Mail This Coupon Today—

General Electric Company, Schenectady 5, N. Y.

Please send me a copy of your Condensed Motor Catalog (No. GEA-4281).

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Announcing Improvements
on the
MISSISSIPPI WAGON

You Now Get More Speed (up to 25½ M. P. H.),
Synchronized 4-Wheel Tractor-Trailer Brakes, Other Features

Improvements made to increase the general versatility and efficiency of the MISSISSIPPI WAGON, now more than ever make it "the World's Most Modern Hauling Unit."

Gear changes in the M-R-S Special International Diesel tractor now make it possible for MISSISSIPPI WAGONS to travel at speeds up to 25½ miles per hour, saving valuable time and increasing profits on long hauls.

Four-wheel trailer brakes are available and are synchronized with the hydraulic brakes on the tractor, providing unusually smooth, effective braking for fast stops and steep grades.

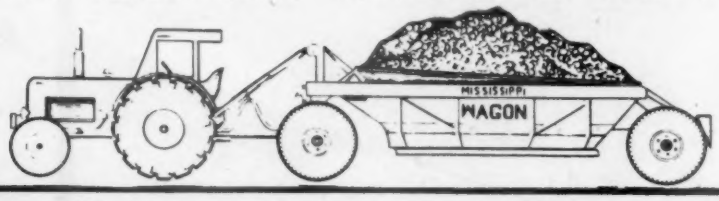
If your problem is hauling over the highways on long hauls, the MISSISSIPPI WAGON will now provide you with still greater economy than heretofore.

If your problem is construction work, the MISSISSIPPI WAGON will give you unusually low hauling costs per yard, placing you in the position of meeting and "beating" that tough postwar competition.

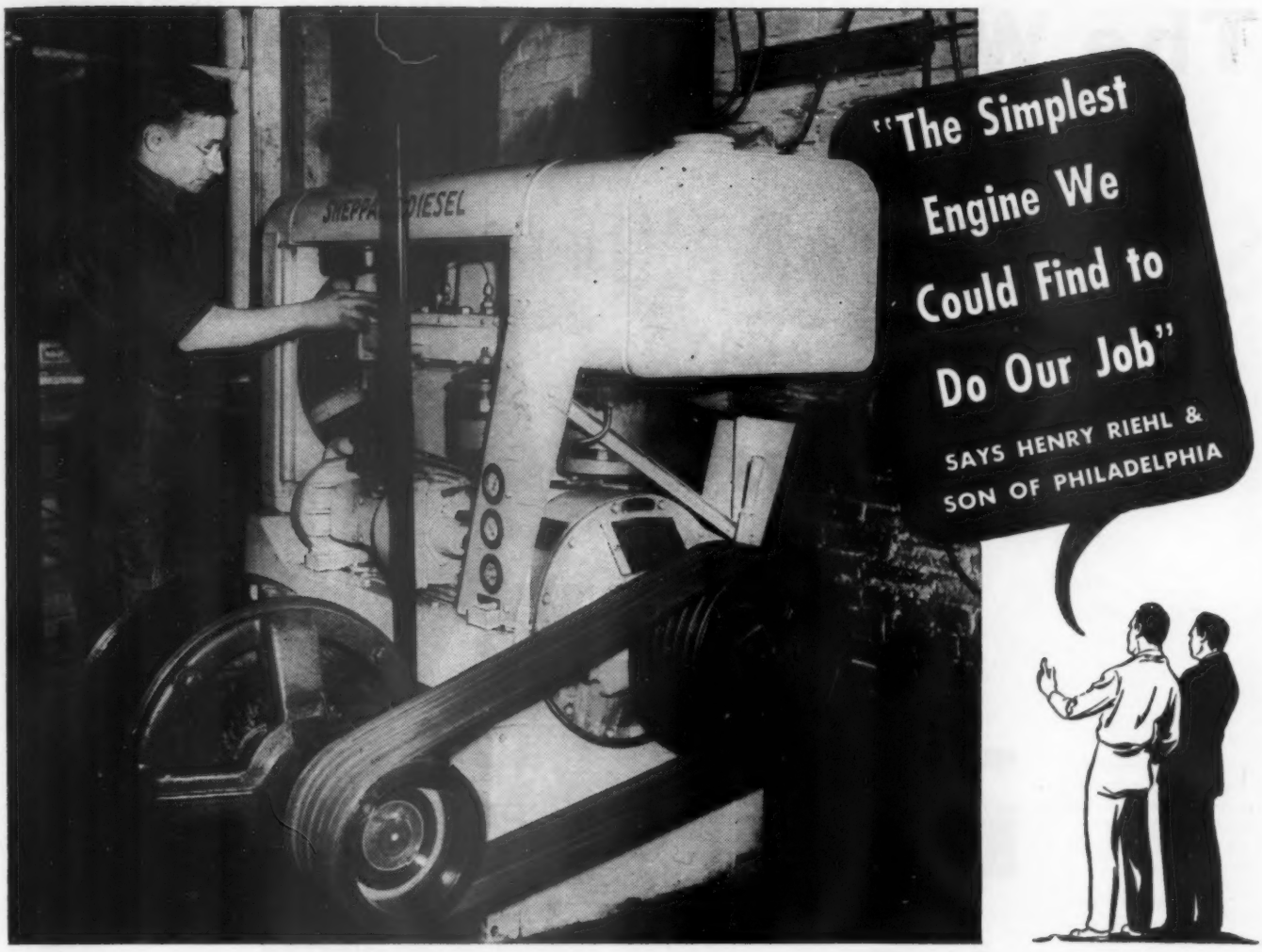
We can make deliveries for essential civilian uses, because our 1945 production is more than twice our 1944 production.

Write us or consult your nearest International Power Distributor for full information on MISSISSIPPI WAGONS—a thorough investigation will warrant your investment in MISSISSIPPI WAGONS—

"THE WORLD'S MOST MODERN HAULING UNIT"



MRS MANUFACTURING CO.
JACKSON, MISSISSIPPI



"POWER for the entire machine shop of Henry Riehl & Son of Philadelphia, Pennsylvania, is supplied by one Model #6 25-horsepower, Sheppard Diesel which was installed in June, 1941, and has been running nine hours a day, six days a week, ever since. The company manufactures narrow fabric textile machinery, working in both metal and wood. The various machine shops are housed in several adjoining buildings and on several floors, and contain both standard and special woodworking machines as well as a completely equipped machine shop. There is a total of eighty machines, the power for all of which is supplied by the Sheppard Diesel. (Note: The machines are never all in operation at the same time.) The Sheppard Diesel was chosen because, in the words of Theodore H. Wagner, one of the partners in the firm, 'it was the simplest engine we could find that would do the work.' Moreover, their own employees are able to fix minor troubles when and if they arise, without the necessity of calling in experts for maintenance work.

"Dependability, cheapness of power, low maintenance cost and quick starting, with power available when needed and shut off when not needed, were the characteristics required by Henry Riehl & Son, and the Sheppard Diesel amply fills these requirements. No other engine was previously used for power, and commercial power could readily be bought, but at greatly increased cost. Figures are not available to demonstrate accurately the savings that have been realized, but Mr. Wagner states that 'the Sheppard Diesel has paid for itself in the time we have had it.' When asked the opinion of the plant management concerning the performance of this engine, Mr. Wagner said, 'we think so much of it that we're going to order a larger unit.' He had particular praise for the efficiency and promptness of the Service Department of R. H. Sheppard Company.

"Last December the engine was overhauled, after three and a half years of service, and is now in new working condition. Apart from this overhaul, there has been no major expense for maintenance or repair."

Your priority may entitle *you* to a Diesel right now. Do as Riehl did—specify Sheppard and let the Diesel pay for itself. Write today for free bulletins and advice about obtaining WPB approval.

POWER UNITS; 8 TO 50 HP • GENERATING SETS; 3 TO 30 KW

Sheppard

ALL AMERICAN **DIESEL POWER UNITS**

R. H. SHEPPARD COMPANY
1113 Middle St., Hanover, Pa.

Please send me free literature describing Sheppard Diesel Power Units.

Name .....

Firm Name .....

Address .....

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The Winning Combination

for top profits in Lime Plants

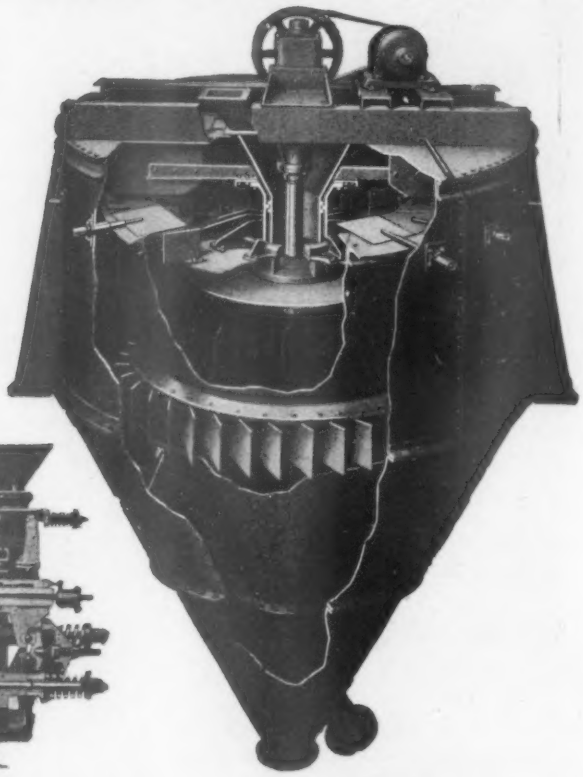
STURTEVANT

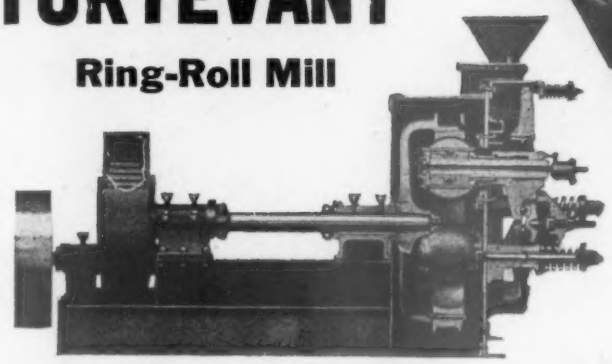
AIR SEPARATOR

plus

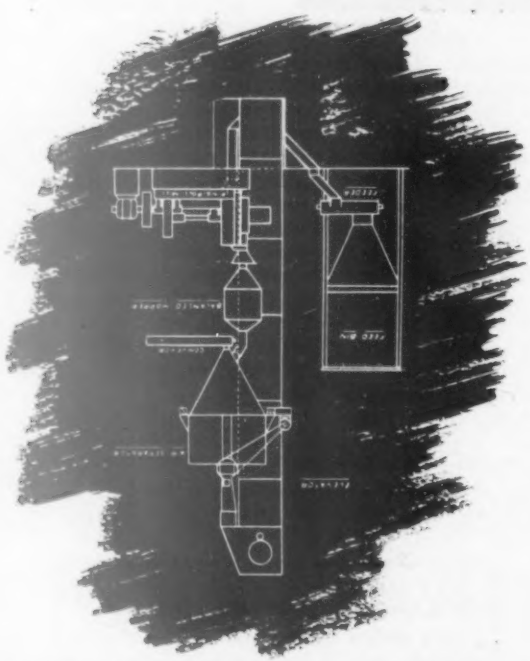
STURTEVANT

Ring-Roll Mill





Recommended for medium and fine reduction of hard or soft materials. Extremely durable. Open door accessibility. Low power requirements. Wide range of sizes.



STURTEVANT Integral Closed Circuit System insures maximum tonnages of accurately sized limestone or similar materials.

Modern pulverizing and sizing practice in the lime industry is based upon the proven performance of the STURTEVANT Air Separator operating in closed circuit with the STURTEVANT Ring-Roll Mill.

The STURTEVANT method selects and continuously removes the finished product in any predetermined fineness, allowing the mill to grind without cushioning fines.

The STURTEVANT Centrifugal Air Separation System involves counterbalancing and counteracting air currents that permit of an accurately sized material, with the rejection of coarser sizes.

STURTEVANT installations increase capacity up to 300% . . . reduce power needs from 10% to 50% . . . show record economy in maintenance costs . . . insure a uniform, high quality product.

STURTEVANT Air Separators are rigidly and compactly built for many years of trouble-free service. Available with diameters from 3 feet to 18 feet, in capacities from 1/4 ton to 50 tons, classifying range of 40 mesh to 350 mesh.

Write for Bulletins describing the STURTEVANT line of material processing equipment.

BUY WAR BONDS

STURTEVANT MILL CO., HARRISON SQUARE, BOSTON 22, MASS.

TRACTION off the Highway!

This is the Thornton Drive Bogie, consisting of 2 driving axles; 2-speed gear case assembly with *Automatic-Locking* Differential in ring gear, "walking beam" type springs; wheels; 8 new tires.

THORNTON gives positive DRIVE TO BOTH REAR AXLES *Without Axle Fight*

Trucks operating off the highway must have 2 rear driving axles with *positive drive* to provide maximum traction.

However, *positive drive* to the rear driving axles is not all that is required to give you the greatest number of truck-work days per year. The Drive also must have *Differential Action* to avoid "axle fight" which causes tires to scuff, wastes fuel, and destroys ring gears, pinions, joints, etc.

The THORNTON *4-Rear-Wheel* DRIVE has proved, through years of grueling work and severe war demands, that it does deliver "go ahead" traction under the most obstinate conditions (and provides 100% more payload; up to 50% gradability; and, certain definite operation economies).

Whether you haul logs from the woods; sand and gravel from the pits; coal from the mines; spread lime over soft fields; or haul heavy oil field equipment; you need the maximum traction provided by the Thornton Drive. Thornton equipped trucks have the power and traction to operate in all kinds of weather, over all kinds of roads. They will work many more days per year than a conventional truck having only one driving axle.

The heart of the THORNTON DRIVE is the THORNTON *automatic-locking* DIFFERENTIAL—an exclusive feature which provides both POSITIVE DRIVE and DIFFERENTIAL ACTION.

Thornton's solution to the problem of obtaining "off the highway traction" without having "axle fight" represents one of the outstanding contributions to the automotive industry during the past 30 years. This *automatic-locking* DIFFERENTIAL, as an integral part of the Thornton Drive, enables the truck to drive as long as there is traction on the wheels of either axle. Its automatic Differential action permits an over or under running of the ring gear of either axle as required by the contour of the road bed, whether moving forward or in reverse.

When the THORNTON DIFFERENTIAL is also used in place of the conventional differential in each driving axle, the ultimate in traction is provided, because *all wheels must rotate* when power is applied.

FREE: *Mail coupon for descriptive folders and full details about the Thornton Four-Rear-Wheel Drive.*

* NO WPB RELEASE NECESSARY

IDEAL FOR LIME SPREADING

THORNTON 4-REAR-WHEEL DRIVE
KEEPS TRUCKS WORKING IN BAD CONDITIONS

Thornton Tandem Co.

8701 Grinnell Avenue, Dept. 32, Detroit 13, Michigan, U.S.A.

Please send me catalog of facts on changing my 1½-2 ton truck into a heavy duty truck.

Name _____

Address _____

City _____ State _____

Make of Truck _____ Year _____

Used for _____

The Skillful Mechanic is known By the Tool He Uses

EVER see a mechanic do a motor job with a single S-wrench? Never! It takes a kit of wrenches of different kinds and sizes for a mechanic to make the most of his skill.

Explosives are the tools of the blaster. From more than 120 Atlas grades and kinds, the blaster can pick the right one to make the most of his skill too.

ATLAS APEX low nitroglycerine, ammonium nitrate type of explosive in large size cartridges with a heaving, spreading action. Adapted for use in either horizontal or vertical drill holes. Available in eight strengths—each strength in three velocities (low, medium, or high) —there are 24 combinations of speed and strength. One of these should provide just the right action for your formation.

Working with explosives users, Atlas representatives have been able to help on many jobs. Perhaps they can make your equipment go further, too.

Go over your blasting problem with the Atlas Representative. Add your knowledge of your job to his specialized knowledge of explosives and methods . . . then select the Atlas explosive for the right blasting result.

APEX

GRADE	% Weight Strength	Velocity feet per second, in the open 1¼" x 8"	VELOCITIES 4½" x 16" CTGS.			Number of Cartridges per 50 lbs. 1¼" x 8"
			LOW	MEDIUM	HIGH	
A	35	7000	10500	13000	19000	115
B	30	6900	9500	13000	19000	115
C	25	6500	9000	13000	19000	115
D	20	6500	9000	13000	19000	115
1	40	7200	10500	13000	19000	115
2	50	7300	10500	13000	19000	115
3	60	7500	10500	13000	19000	115
4	70	7800	10500	13000	19000	115

Standard packing for Apex is:
4" x 8⅛ lbs. | 4" x 12½ lbs. | 5" x 12½ lbs. | 5" x 16⅔ lbs.
5" x 25 lbs. | 6" x 25 lbs. | 6" x 50 lbs. | 7" x 25 lbs.
7" x 50 lbs. | 7½" x 25 lbs. | 7½" x 50 lbs. | 8" x 50 lbs.

ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

Watch it

SET THE PACE FOR ITS CLASS

THE fast-drilling, 56-pound CP-42 Sinker features a sturdy, trouble-free, single retainer spring encircling the front end—lengthening service life and lowering maintenance cost. Ideal for general excavation, shaft sinking, road work and quarry drilling. Economical in air consumption. Powerful air blow keeps even the deepest holes free from cuttings. Prove the pace-setting advantages of the CP-42 Sinker Drill under your own operating conditions. Arrange for a demonstration.

There's a CP Sinker for every purpose, from the 28-pound CP-22 to the 119-pound, heavy duty CP-60. All are convertible to wet machines.

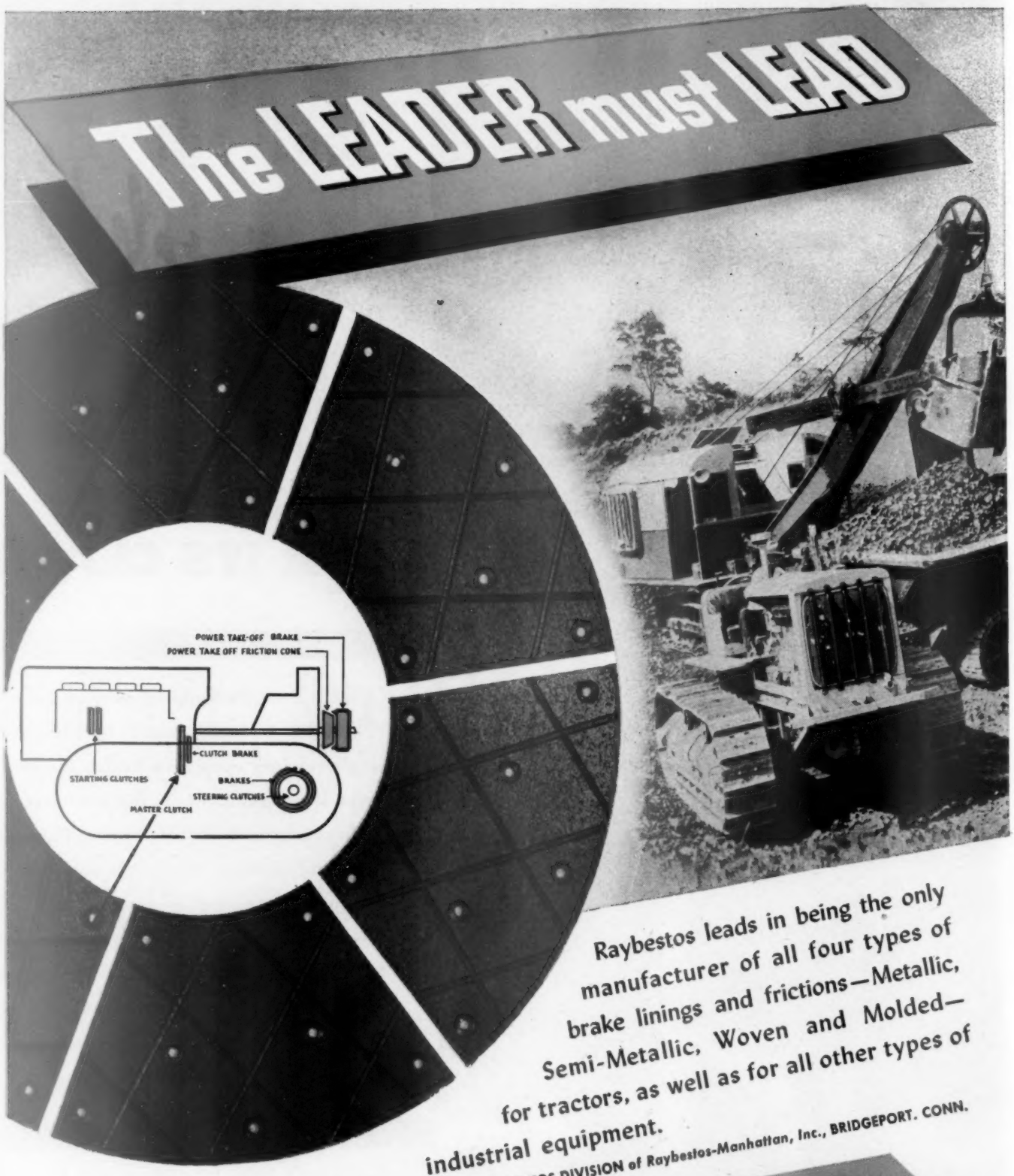
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

The LEADER must LEAD



Raybestos leads in being the only manufacturer of all four types of brake linings and frictions—Metallic, Semi-Metallic, Woven and Molded—for tractors, as well as for all other types of industrial equipment.

THE RAYBESTOS DIVISION of Raybestos-Manhattan, Inc., BRIDGEPORT. CONN.

Ray-Metl Master Clutch Facing for tractors. A composition of asbestos and fine metallic powder

Raybestos

INDUSTRIAL FRICTION MATERIALS

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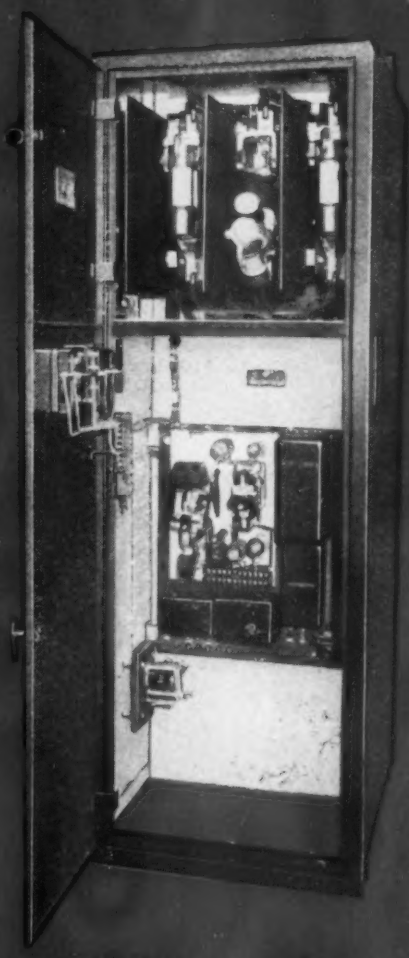
For Shovels, Cranes, Hoists, Tractors, Earth Movers.

HOW LIMITAMP CONTROL PROTECTS YOUR MOTOR



1/2-CYCLE OPERATION clears high-voltage fault currents before they can do harm

LIMITAMP control, for use with squirrel-cage, synchronous, and wound-rotor motors, provides fast, positive short-circuit protection so necessary for safe operation at high voltages.

Your Motor Is Protected by These Three Limitamp Features

1. **½-cycle Operation**—By means of Type EJ-2 fuses, a rise in current due to a short-circuit is cut off in less than one-quarter cycle, and cleared in less than one-half cycle—long before fault currents can harm your motor.

2. **Efficient Overload Relays**—Accurately calibrated against actual motor characteristics, isothermic overload relays protect your motor from overheating due to sustained overloads, locked rotor, or single-phasing.

3. **Undervoltage Protection**—When there is a low voltage or when power fails, the control *takes the motor off the line*, and the motor will not restart on return of power.

Noiseless in Operation—Limitamp control works silently. Operators are not startled by any part of its operation. Even when a fuse blows, there is no noise. There's only a plainly visible bulge in the end of the fuse.

On voltages up to 4200 volts, the interrupting capacity of Limitamp control makes it the logical answer for any application where high-voltage fault currents are encountered.

A Co-ordinated Control

Air-break contactors, designed to meet the most severe requirements of high-voltage motor-control service, are co-ordinated with the EJ-2 fuses. Because the full short never passes through these contactors, it is possible for them to have a mechanical life of several million operations, and contact-tip life many times that of conventional devices. Bulletin GEA-4247 gives a well-illustrated description of all the features that make Limitamp control tops in the field of high-voltage control. Ask our local office for a copy, or send the coupon direct to General Electric Company, Schenectady 5, N. Y.

Buy all the BONDS you can—and *keep all you buy*

General Electric, Section 676-163
Schenectady 5, N. Y.

I'd like more information about your Limitamp control. Please send me Bulletin GEA-4247.

Name .....

Company .....

Address .....

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8X00

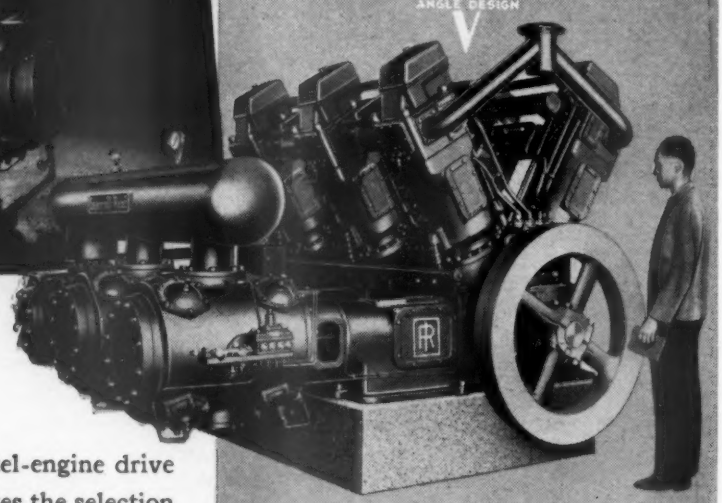
GENERAL ELECTRIC

Maybe YOU *have compressor problems that can be solved with the* DIESEL-DRIVEN

TYPE
XVO

DIESEL-ENGINE AND COMPRESSOR IN ONE MACHINE

ANGLE DESIGN



This 4 XVO single-stage compressor, above, supplies medium-pressure air at a factory. At right is a 6 XVO two-stage compressor.

When economy dictates the selection of Diesel-engine drive for compressors, certainly the same reason dictates the selection of the most economical type.

One gallon of diesel fuel will compress 5600 cubic feet of free air to 100 pounds pressure . . . in an *XVO*. Compare this high over-all economy with any other compressor plant.

The XVO combines a heavy-duty, four-cycle diesel engine and a heavy-duty, double-acting compressor in a single, compact machine. It has fully demonstrated its ability to operate continuously at full load, 24 hours per day, over long periods of time . . . it was built for that purpose.

1 IF YOUR COMPRESSOR PLANT SHOULD BE INDEPENDENT OR ISOLATED.

2 IF ECONOMY IS A PRIMARY CONSIDERATION.

3 IF EXISTING POWER FACILITIES CANNOT CARRY ADDITIONAL LOAD.

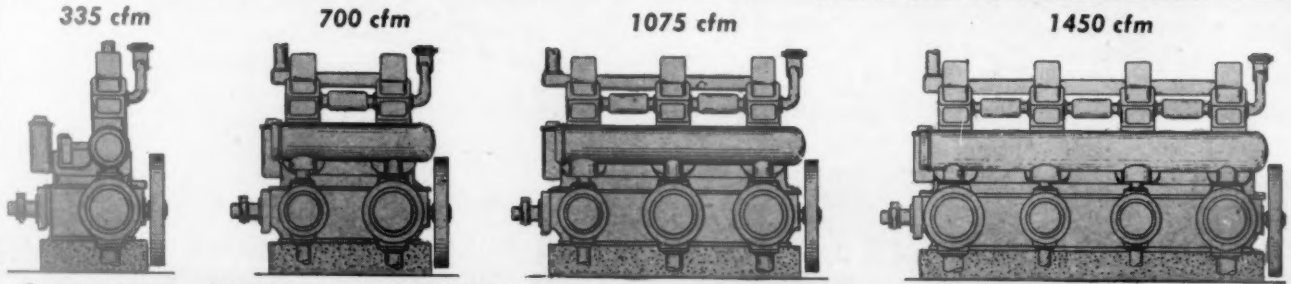
Select the **XVO**

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y. 6-511

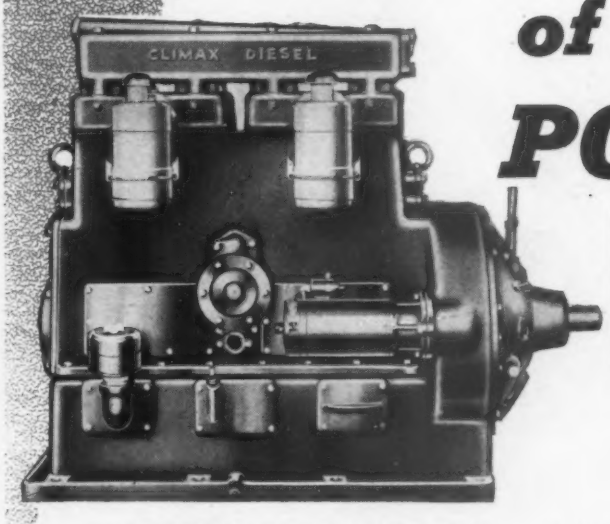
Cfm free-air actual delivery at 100-lb pressure and sea level

335 cfm *700 cfm* *1075 cfm* *1450 cfm*

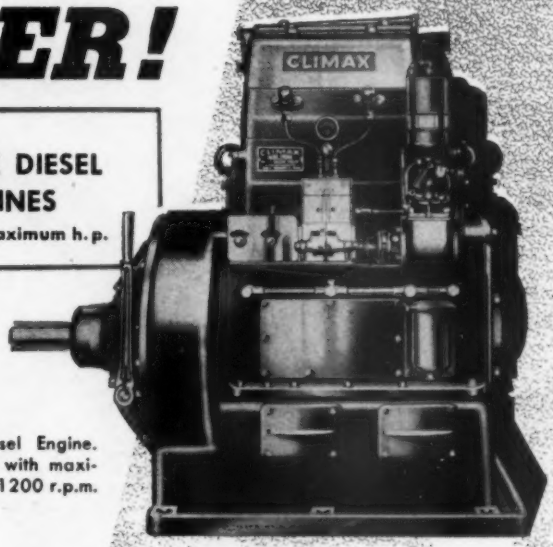


Compressor cylinders are available for air, gas, and ammonia . . . for practically any pressures

LITTLE GIANTS of Diesel POWER!



CLIMAX DIESEL ENGINES
22 and 44 maximum h. p.



CLIMAX MODEL D297 Diesel Engine. Four cylinder, full Diesel, maximum rating 44 h.p. at 1200 r.p.m. Also available with speed reduction units.

CLIMAX MODEL D148 Diesel Engine. Two cylinder, full Diesel with maximum rating of 22 h.p. at 1200 r.p.m.

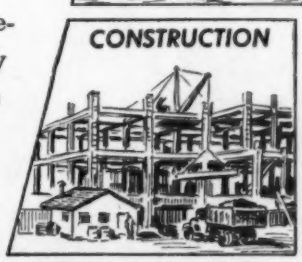
WHEREVER a compact, space-saving source of dependable, economical power is required, these small Climax Diesel Engines are to be found doing *yeoman* service—driving fans and blowers, pumps, compressors, conveyors and hoists, small locomotives and power saws, powering boats, supplying auxiliary mechanical power on large vessels.

These smooth-running Climax Diesels—strongly built with one-piece construction of cylinders and crankcase—consume only cheap, low grade, standard fuel oil. They are 4-stroke-cycle type, solid injection, compression ignition engines that start at the touch of a button, by local or remote control. Dependable, quick starting, easy to operate, and safe.

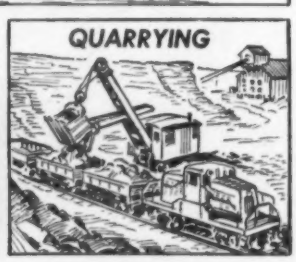
Standard equipment includes American Bosch fuel pump and injection nozzles, positive lubrication and cooling and electric starting equipment. For complete information and specification bulletin, write Climax Engineering Company, Clinton, Iowa.

MARINE

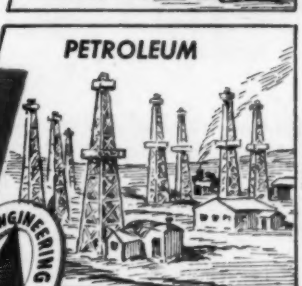
CONSTRUCTION



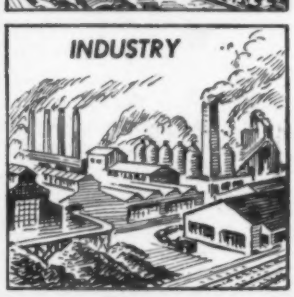
QUARRYING



PETROLEUM



INDUSTRY



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Builder of Climax BLUE STREAK ENGINES and GENERATING SETS

CLIMAX ENGINEERING COMPANY

POWER, LIGHT and STANDBY SERVICE

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HENDRIX *Lightweight* DRAGLINE BUCKETS

3/8 to 30 Cubic yds.

- ★ 20 to 40 per cent lighter than other buckets, type for type.
- ★ All welded construction — for greater strength and durability.
- ★ Manganese steel chains, fittings, and reversible tooth points.
- ★ Gets full load pay material every trip — even in wet digging.
- ★ Perfectly balanced—handles easier—fills faster dumps quicker, cleaner.
- ★ Available in three types—light, medium, and heavy duty.

Write for descriptive Literature . . .
. . . or ask your dealer . . . today!

DESOTO FOUNDRY, INC. • MANSFIELD, LOUISIANA

"Primacord helps us stretch our manpower."

Fewer men can accomplish more when Primacord comes on the job. That's why pits and quarries the country over are using it to help compensate for reduced manpower.

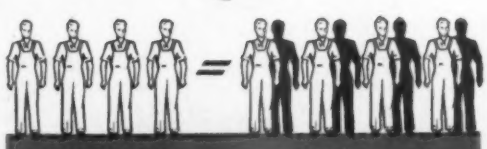
Primacord conserves the time of drillers and equipment handlers. It permits more holes to be shot at one setup — hence, more drilling between equipment moves.

Primacord conserves the time of skilled labor. It is a detonating fuse which ordinary laborers can handle, because sparks, friction or flame will not detonate it.

Primacord conserves the time of powder men. One simple lacing of one cartridge, without a cap, is required for an entire hole, even when decks are employed. Primacord detonates every cartridge it touches. Hooking-up requires simple knots, and a cap for the main line only.

Primacord conserves shovel time. Its more effective use of explosive power gives better fragmentation for easier handling. No caps, no unexploded powder is found in the rock pile when Primacord is properly used.

P-5



4 good men worth double with Primacord

THE ENSIGN-BICKFORD COMPANY • Simsbury, Connecticut

Also
ENSIGN-BICKFORD SAFETY FUSE
Since 1836

PRIMACORD-BICKFORD Detonating • Fuse •

The Columbia Quarry Krause plant in which all material handling equipment for the new expansion was furnished by Stephens-Adamson.

S-A Helps Limestone Plant

Boost Production

To Meet Huge Demand

When greatly increased demand for agricultural limestone taxed the capacity of Columbia Quarry Company's plant at Krause, Illinois, the company decided to install new handling and pulverizing equipment. It is a matter of pride to Stephens-Adamson that it was among those called in to help design and install the necessary new machinery.

Helping rock producers expand their operations with efficient, designed-to-the-job equipment is a familiar role to S-A engineers. It's a job they have been doing for the 43 years S-A has specialized in the development of better material handling methods and equipment.

When you plan to improve or expand your facilities, take advantage of this two-way S-A service: (1) the ability to design exactly the system you need for fast, low cost handling, using (2) the right equipment selected from the complete line of S-A manufactured handling units.

STEPHENS-ADAMSON MFG. CO.

7 RIDGEWAY AVENUE, AURORA, ILLINOIS — LOS ANGELES, CALIF. ★ BELLEVILLE, ONT.

Designers and Manufacturers of All Types of

BULK MATERIAL HANDLING EQUIPMENT

Superior

a name you can trust in Diesels

SUPERIOR DIESELS • STATIONARY, 28 to 1325 H. P.
MARINE, 28 to 1325 H. P. • GENERATOR SETS, 20 to 928 kw.

Superior **ENGINES**
Division of
THE NATIONAL SUPPLY CO.
Plant and General Sales Office:
Springfield, Ohio

PATTERN FOR ictory OVER WEAR

Long speed reducer life is, to a great extent, a matter of gear design and gear cutting. Of course, housing, shafts, bearings and lubrication system must be "right" but these parts cannot "pinch hit" for faulty gears.

The gears used in Farrel units are of the well-known *Gear with a Backbone* type, cut by the Farrel-Sykes process of precision generation. Because the teeth are continuous, without a center groove, the entire face width is put to work. This provides high load-carrying capacity and extra strength to withstand stresses, shocks and heavy loads. Combined characteristics of overlap or interlacing of the teeth, gradual engagement and inclined line of pressure, reduce wear to a minimum by maintaining involute profile and correct tooth action throughout the life of the gears.

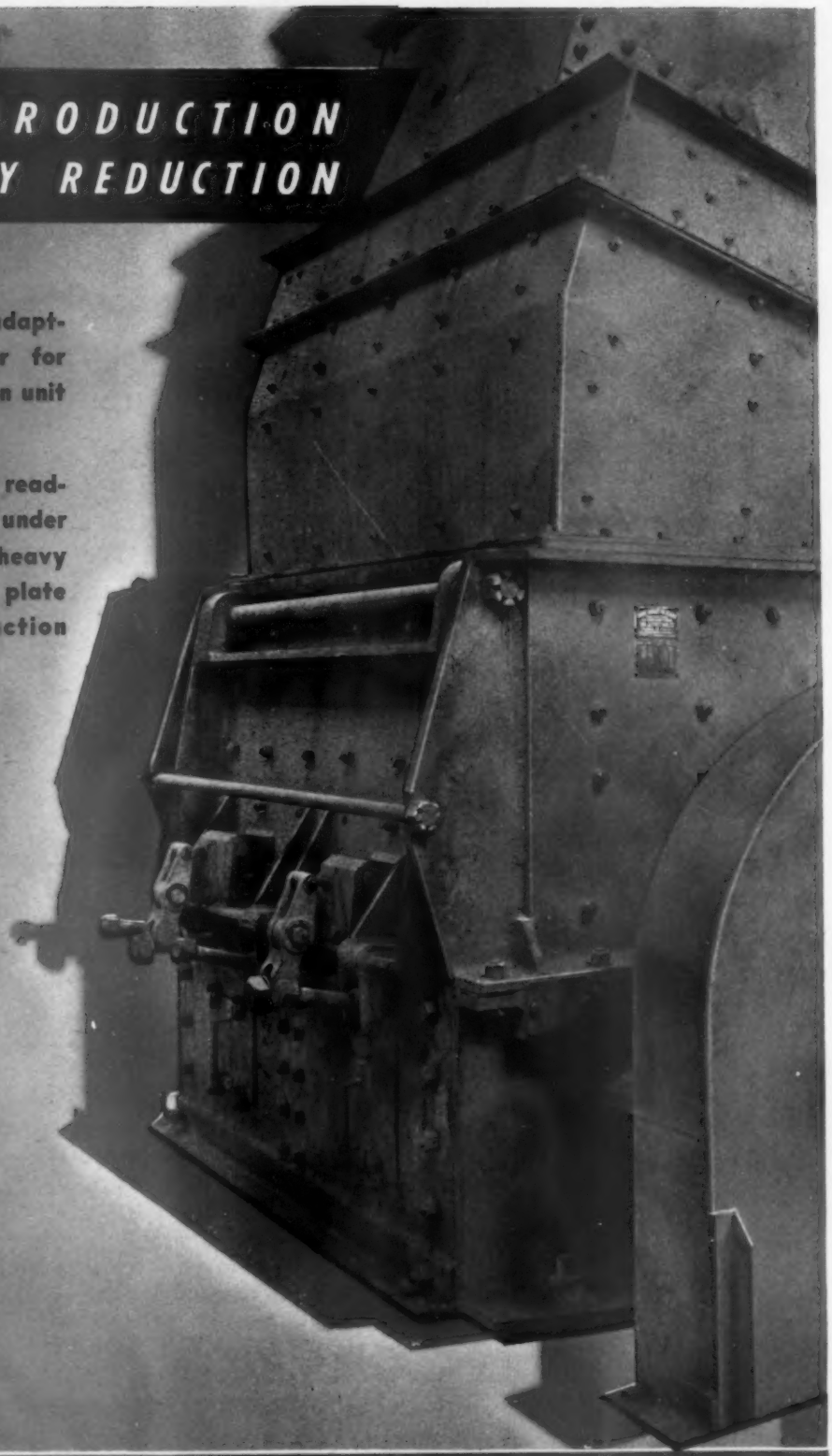
Farrel Gear Units are available in a complete range of sizes, for any capacity, with ratios up to 300:1. Write for 80-page, descriptive catalog No. 438.

FARREL

Farrel-Birmingham

FARREL-BIRMINGHAM COMPANY, INC.
344 VULCAN ST. • BUFFALO, N. Y.
Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Los Angeles, Tulsa, Houston

INCREASE PRODUCTION WITH JEFFREY REDUCTION



Large capacity and great adaptability make this pulverizer for reducing limestone a champion unit in any plant.

Ideal for making Ag stone or readily adjustable for 2" and under or intermediate sizes. A heavy duty pulverizer of armor plate and welded steel construction throughout.

JEFFREY
HAMMERMILL
42" x 66"
Type B

THE JEFFREY MANUFACTURING COMPANY
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THEY PICK UP "EGGS" WITH WIRE ROPE

Giant "eggs" for our bombers require frequent handling before they are dropped on the enemy. Juggling heavy bombs is one of the vital everyday tasks which our men must perform . . . and one in which tough, dependable wire rope is important.

Less dramatic, but equally important, is the work which wire rope is doing on the home front. In oil fields, forests, mines, mills and shipyards . . . you'll find men relying on the stout, steel muscles of Wickwire Spencer Wire Rope to do a variety of heavy hoisting and hauling jobs.

With wire rope harder to get, each length must be made to last longer. And, when you need new rope, specify WISSCOLAY *Pre*formed, manufactured by Wickwire Spencer. It lasts longer than the non-preformed; is easier to cut, splice and install; is kink-resistant and safer to handle.

If you have a wire rope problem our wire rope engineers will be happy to help solve it. Just write Wickwire Spencer Steel Company, 500 Fifth Avenue, New York 18, N. Y.

THIS FREE BOOK SHOWS HOW TO MAKE WIRE ROPE LAST LONGER

"Know Your Ropes" contains 82 pages of suggestions on proper selection, application and usage of wire rope. This easy-to-read, profusely illustrated manual can save you money . . . and save wire rope for the war fronts. Send for your free copy now.

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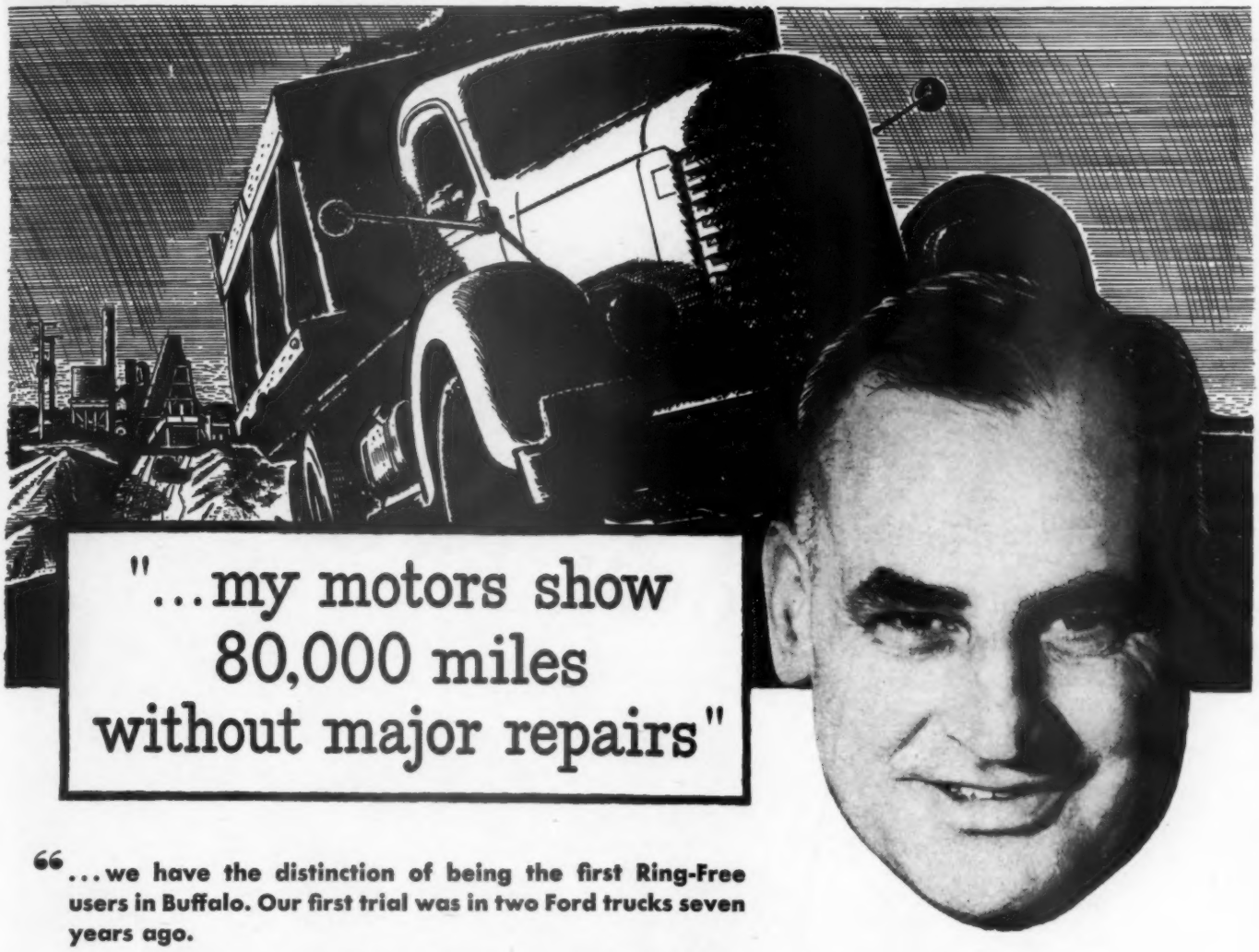

"...my motors show 80,000 miles without major repairs"

"...we have the distinction of being the first Ring-Free users in Buffalo. Our first trial was in two Ford trucks seven years ago.

...our fleet has increased to fourteen trucks including Autocars, Internationals, Fords and one Chevrolet.

...trucks are all used in hauling sand and gravel...the hardest kind of work on trucks as roads are bad...loads are heavy. Due to conditions there is a constant uneven strain on motor bearings.

...if Ring-Free did not have a tough film strength that protected these bearings my motors would not be able to show 80,000 miles without major repairs as many of them have.

...Ring-Free's ability to penetrate even to the top of the pistons and keep the upper rings free gives my motors all the power they were intended to have.

...my first International truck went 110,000 miles with only $50 repairs...proper lubrication was responsible."

Excerpts from letter of–

George Muehlbauer

George Muehlbauer
205 Courtland Avenue
Buffalo, New York

MACMILLAN RING-FREE MOTOR OIL

Operators of all types of equipment report lower-cost, more efficient performance with Ring-Free Motor Oil. Find out how Ring-Free can help lick your toughest lubrication problems. ... Phone or write the nearest Macmillan office.

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PIT AND QUARRY

MAY, 1945

Vol. 37 No. 11

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MEMBER AUDIT BUREAU OF CIRCULATIONS

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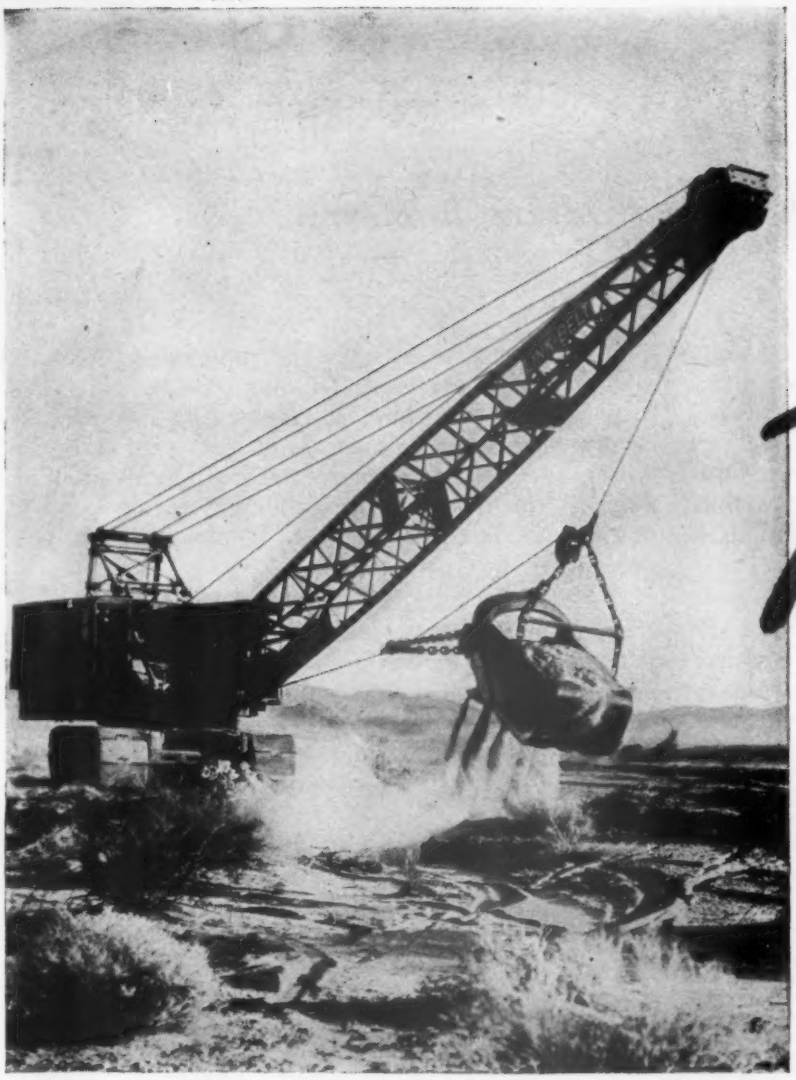

SMOOTH *Rope work*

DIGGING drainage channels on the desert to protect the Colorado River Aqueduct from the rare—but extremely heavy—desert rains is one of the countless jobs for construction equipment in which smoothly functioning wire rope plays an essential part.

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EDITORIAL

Stabilizing the Construction Industry

THE cost of every industry is borne by the society in which it operates. Low wages, the weight of business failures, inefficiency in production, wasteful distribution, fluctuations in the output curve—all these, as well as other factors in the cost of doing business, ultimately find their way to the general public which, unable to shift the burden to other shoulders, bends under it and absorbs it.

The effects of inefficiency and high production costs are shown not only in the financial statements of the concerns that comprise any single industry. They carry over—although the devious paths they follow usually conceal the nature and direction of their movements—into unrelated industries, into the lives of the workers which the industry employs, into the industries it serves, and often even backward into the industries that serve it. The dependence of individual industries upon each other makes it impossible to bury the high cost of industrial inefficiency anywhere in the sequence of steps from the recovery of raw materials to the ultimate use of the end product in the hands of the consumer. That is why inefficiency, especially when it reaches industry-wide proportions, becomes a matter of public concern.

Construction is an industry in which glaring inefficiencies exist. Some of these, as in other industries, are the result of climatic conditions. Others have grown out of the lack of incentive to seek for greater efficiency, out of competitive situations in which inefficiency and high costs have been tolerated by tacit understanding, out of a lack of planning resulting from the unforeseeable and often whimsical demands of buyers who "want what they want when they want it", and out of other causes. Construction provides a striking example of those industries in which the inefficiencies are carried not only forward to the buyers they serve but also backward to the industries that serve them. That makes industrial inefficiency in construction a subject of interest to the producers of the materials of construction as well as to the general public.

Lack of continuity of operations is one of the phases of inefficiency in the construction industry that has been recognized, deplored and accepted as one of those things about which nothing can be done. As long as people have their own ideas of what they want to have built, when they want it and where they want it, and of what they are willing to pay for it, the activities of the construction industry, at least in the field of private building, are felt to be necessarily and unavoidably inefficient. With regard to public construction, however, it is widely recognized that such a situation need not exist, because public works such as highways, bridges, government buildings, dams, and the like can be planned far in advance of their construction and with some intelligent respect for the subsequent effects of inefficiency on the general economy. The effects of such intelligent planning on employment could hardly be overemphasized in the case of the construction industry, nor could the basic construction-material industries which serve it be indifferent to any method that would flatten the curves of employment and production in their own plants.

Already our state highway departments have progressed far in the planning of post-war projects. The Federal Highway Act in the three years covered by its provisions will alone require each year for its fulfillment 95,750 man-years of labor on the sites of construction and 215,600 man-years of off-the-site labor employed in the production of the materials of construction. More than 40 per cent. of the total cost of the program will be spent for the materials produced by makers of cement, stone and clay products, the producers of sand and gravel, ready-mixed concrete, lumber, iron and steel, etc., all of whom would benefit from the introduction of greater efficiency into the construction industry.

More than a year ago Beardsley Ruml, speaking at the Conference on Post-War Housing at Chicago, said of the construction industry that "reasonably continuous operations within the year and over the years would greatly increase the efficiency of the industry, and any given level of employment would yield a larger and larger product as the years went by. The traditional recurrent idleness of men and equipment in the construction industry has forced, for sheer survival, the adoption of practices which all deplore but which, I feel sure, can be largely eliminated once the industry comes to have confidence in continuity of activity." Within recent months he has suggested that the Congress investigate the industry in an effort to find out whether through intelligent planning it could not be made more stable.

IF THE Congress should decide to make such a study and if regulatory laws should be suggested, our industries would certainly join the construction industry in hoping and urging that they should not be made so tight as to stifle individual initiative or hamper the healthy development of private enterprise, while providing at the same time the basis for working out a less erratic pattern of employment and output than the industry has heretofore shown. If the problem is approached with open minds by all concerned—contractors as well as legislators—it should be possible to work out a plan that will encourage and protect those who take great business risks and remove much of the fear and economic waste that have been characteristic of the industry for decades.

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SHELL

PIT AND QUARRY

CHICAGO MAY, 1945

Olson Made President Of Producers' Ass'n. At San Francisco

Carl R. Olson, manager of the Henry J. Kaiser Company of Oakland, California, was elected president of the Rock, Sand & Gravel Producers' Association of Northern California at that group's annual gathering in San Francisco March 15.

Edmund Brovelli, secretary-treasurer of the Basalt Rock Company, Napa, was elected vice-president; Anson S. Blake, head of Blake Brothers Company, Richmond, became executive secretary; and W. W. Dennis was made assistant executive secretary. Speakers were Harry Morten, legal counsel and labor-relations advisor of the Kaiser company; R. K. Humphries, president of Pacific Coast Aggregates, Inc.; Anson S. Blake, the retiring president; and President-elect Olson.

Two Kansas City Firms Announce Reorganization

Reorganization of the Centropolis Crusher Company and the Ready Mixed Concrete Company, Kansas City, Missouri, both of which were headed by the late Thomas J. Pendergast, was announced April 7 by the two firms. John S. Sullivan, formerly with the Dewey Portland Cement Company, was named president of Ready Mixed Concrete; and Charles I. Campbell, former vice-president of the A. C. Thompson Lumber Company, was made president of Centropolis. Frank Carswell, associated with Mr. Pendergast in the Ready Mixed concern until 1941, became vice-president of both firms.

Stock control of Centropolis passed to a new group which also assumed the management of Ready Mixed Concrete and agreed to purchase the majority of that stock. According to James E. Burke, new secretary-treasurer of the reorganized firms, the Pendergast estate holds 45 of the 370 shares of Centropolis and a majority of the Ready Mixed stock.

Eastern Magnesia Talc Holds Annual Election

The annual election of the Eastern Magnesia Talc Company, Inc., Burlington, Vermont, held recently in Barre, resulted in the following list of officers: President, Joseph T. Smith, executive vice-president of the Rock of Ages Corporation; vice-president and general manager, E. W. Magnus; treasurer, R. L. Patrick.

Hansen & Neuheisel Open Wisconsin Quarry

A new limestone quarry was opened recently at Arcadia, Wisconsin, by Hansen & Neuheisel. Gerald Neuheisel, one of the partners of the firm, formerly was associated with his brother, Norbert, in the Neuheisel Lime Works.

Coming Events

May 17-19, 1945 — Hot Springs, Virginia. Board meeting, National Lime Association, The Homestead.

May 23-24, 1945—New York. Annual meeting, National Industrial Sand Association, Hotel New Yorker.

June 18-22, 1945 — Buffalo. Annual meeting, American Society for Testing Materials, Hotel Statler.

National Gypsum Co. Tells Expansion Plan Totaling $10,000,000

The National Gypsum Company announced that it would use approximately $4,000,000 of a $10,000,000 loan to construct two new plants. A gypsum products plant at Baltimore will cost about $2,500,000; and a lime plant at Kerns, Virginia, about $1,500,000.

Extensions also have been planned for the company's plants at Savannah, Georgia; Mobile, Alabama; and Rotan, Texas. It was stated that National Gypsum's post-war plans envision an increase of 25 per cent. in over-all capacity.

1,000-Acre Area Leased By Pacific Coast Firm

Pacific Coast Aggregates, Inc., one of the leading producers of aggregates in the San Francisco area, has leased approximately 1,000 acres in the vicinity of Auburn, California, formerly worked by gold dredgers.

The company is reported to be planning the recovery of gold, zirconium, and other metals known to be present, while processing the sand and gravel for commercial sale.

Lehigh Portland Cement Reports 1944 Net Profit

Lehigh Portland Cement Company stated that, although two of its plants were closed and seven of the remaining 12 were operated at less than one-half capacity throughout 1944, the company nevertheless could report a net profit for the year. While the return on invested capital in 1943 was 4.6 per cent., 1944 figures showed only 1.1 per cent.

Construction Volume Increases in 1945 Dodge Report Shows

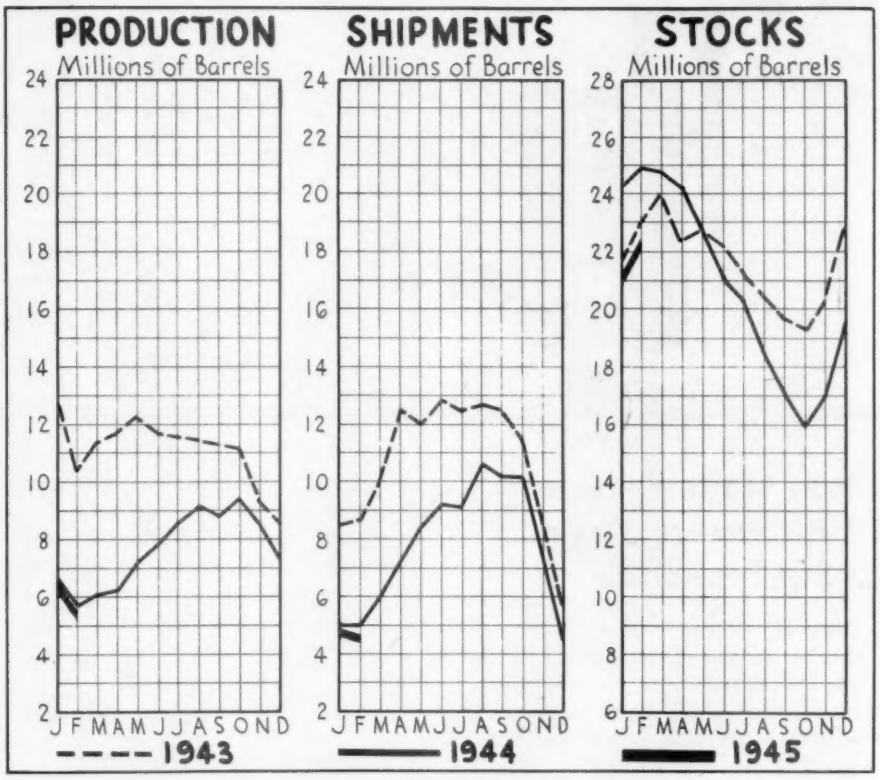
Substantial increase in construction volume in the 37 states east of the Rocky Mountains during the first quarter of 1945 as compared with the similar period of last year was reported today by F. W. Dodge Corporation on the basis of its field-staff reports.

The volume of all construction contracts awarded in the 37 states during the first three months of this year totaled $616,780,000 as compared with a total of $472,867,000 in the first quarter of 1944, the Dodge corporation reported.

The main increase in activity was in nonresidential construction, especially buildings used for manufacturing purposes. The comparative figures for all nonresidential construction were $205,137,000 in the first quarter of 1944 and $388,612,000 in 1945.

During the first three months of this year publicly-owned construction accounted for 60 per cent. of all contracts awarded, while during the first quarter of 1944 publicly-owned construction accounted for 77 per cent.

The first quarter's volume exceeds that shown for the first quarter of the year 1938, and compares favorably with the volume shown for the first quarter of 1937 and 1940.



Output of cement during February, 1945, totaled 5,371,000 barrels, or 6 per cent. below production of February, 1944. Mill shipments of 4,574,000 barrels during February were 10 per cent. below the movement from mills in the same month of 1944. Stocks of finished cement at mills on February 28 totaled 22,164,000 barrels, a slight decline from the quantity on hand on February 29, 1944.

Chester Sand Co. Men Operate Temporary Ferry

"Paddy" Lawler and Elmer Rinne, experienced river men who own and operate the Chester Sand Company at Prairie du Rocher, Illinois, have gone into an "essential" sideline. During the construction of a new bridge across the Mississippi, they are operating a ferry to serve local traffic. The partners purchased an old eight-car ferry, reconditioned it, and put it into service. They plan to use the ferry barge in their business after the bridge has been completed.

Oregon Silica Sand Plant Supplies Local Foundries

One of the few silica sand plants in the northwestern part of the United States, owned by the Defense Plant Corporation, is now being operated three miles east of Eugene, Oregon, by Silica Products, Oregon, Ltd. High-grade silica foundry sand is being produced in large quantities for Pacific Coast steel foundries, partially replacing long-haul shipments from the eastern states. The $175,000 plant turns out about 100 tons for each eight-hour shift. Silica Products, Oregon, Ltd., plans to purchase the plant after the war and expects to expand its output considerably.

New Officers, Directors Elected by Chicago Firm

The Dolese & Shepard Company of Chicago announced the following results of their recent annual election: W. J. Lynch, president (re-elected); Albert R. Hock, president of the Edison Fuel & Material Company of Chicago, vice-president; William J. Stoffel, treasurer (re-elected); and A. E. Trimarco, secretary (re-elected). Among the newly elected directors are W. A. Armstrong, president of the Universal Granite Company, president of the Dell Rapids Quarry Company and treasurer of the Wisconsin Granite Company, all of Chicago; and W. R. Carney, president of the Superior Flake Graphite Company of Chicago.

Standard Materials Corp. Acquires New Property

An Indianapolis firm, the Standard Materials Corporation, purchased the equipment of the H. & R. Stone Company of Lapel, Indiana, formerly owned by Samuel Henry of Pendleton, Indiana. Standard also leased the Cascadden stone quarry, which Mr. Henry has operated.

Additional machinery and equipment being installed will bring the annual output of the company to an estimated 250,000 tons of agricultural limestone and road stone.

L.I.M.E. Offers Aid To Meet Emergencies

L. I. M. E., Lime Industry, Management & Engineering, of Hershey, Pennsylvania, recently announced an emergency service, through which it will send experienced operators and engineers for short-time assignments in limestone mining or quarrying, limestone processing, calcining, sludge reburning, kilning. The service was designed to meet emergencies such as breakdowns, illness or absence of local staff members, kiln lining repairs, construction projects or plant alterations.

Kaiser Engineers Is Formed to Serve World in Many Fields

Engineers long associated with Henry J. Kaiser, and responsible for the design and construction of some of the world's outstanding projects, have been organized as a permanent

Henry J. Kaiser

group known as Kaiser Engineers, with headquarters in the Kaiser Building, Oakland, California, it was recently announced by Henry J. Kaiser.

This move will make available to others the engineering talent which has been responsible for the design of many of the Kaiser projects. Of the more than 200 members of the staff in Kaiser Engineers many were employed on such projects as Boulder, Grand Coulee and Bonneville Dams; Delaware Aqueduct; the Kaiser steel plant near Fontana, California; the world's largest cement plant owned by Permanente Cement Company; the carbothermic magnesium plant of The Permanente Metals Corporation; and the record-breaking shipyards at Richmond, California; Portland, Oregon, and Vancouver, Washington. Members of this organization conceived, designed and built the nine and one-half mile conveyor belt which hauled the gravel for Shasta Dam. They also solved many difficult problems in connection with the construction of Bonneville Dam.

Henry J. Kaiser is president of the new organization, with E. E. Trefethen, Jr., vice president; T. M. Price, vice president; and George Havas, vice president and general manager. It is the announced policy of the company to undertake engineering work in any part of the world. The organization is well-rounded and includes qualified engineers in all of the major fields of engineering—civil, hydraulic, structural, mechanical, electrical, architectural and metallurgical. An experienced staff is available for procurement of materials and equipment. Consulting engineers will be engaged as circumstances warrant. George W. Vreeland will serve as chief consulting engineer and George B. Scheer as chief consulting electrical engineer.

Buyers of Kentucky Plant Announce Incorporation

The Cedar Bluff Stone Company of Princeton, Kentucky, announced that its articles of incorporation had been approved by the secretary of state. The firm, which was capitalized at $200,000 and organized by William B. Stone, J. R. Breeden and H. H. Coil, will carry on the business formerly owned and operated by W. C. Sparks.

Lawrence Introduced As U. A. Leeds Manager

A photograph of W. O. Lawrence, recently appointed manager of Universal Atlas Cement Company's plant at Leeds, Alabama, arrived too late for publication with our story

W. O. Lawrence

in the April issue. We take pleasure in presenting Mr. Lawrence to our readers. He formerly was assistant manager at Leeds after having served U. A. in various capacities there and in New York City.

Asbestos Production In U. S. Rises in 1944; Canadian Output High

Although for security reasons no statistics can now be released on asbestos, the Bureau of Mines will publish cumulative data on the strategic minerals at the termination of the war emergency, according to a recent announcement.

Production in the United States was somewhat higher in 1944 than in 1943, but domestic sales furnished only 1½ per cent. of domestic requirements. Canada continued to furnish the larger part of our needs of chrysotile, but much of that supplied by the Dominion consists of shingle stock, paper stock and other of the shorter nonspinning grades. Africa supplied a substantial part of the longer grades needed for military and essential civilian applications.

The general situation improved greatly throughout 1944. No serious interruption to imports occurred, and the flow of materials both from Canada and Africa was sufficient to meet all current requirements and to build up a reserve for future commitments. The following figures for Canadian production in 1944 have been released by the Dominion Bureau of Statistics: Crudes, 1,898 short tons, valued at $700,428; fibers, 371,075 short tons, valued at $17,471,874.

Gen. MacNider's Landing First on Eastern Luzon

The first American landing made on the eastern shore of Luzon at Legaspi was spearheaded by Brigadier-General Hanford MacNider's 158th regimental combat team. General MacNider is president of the Northwestern States Portland Cement Company of Mason City, Iowa. He served as Assistant Secretary of War from 1925 to 1928.

Nova Scotia's Barite Production Increases

According to statistics released recently by Canadian Industrial Minerals, Ltd., of Nova Scotia, barite production on its holdings increased from 22,500 tons in 1943 to 114,147 tons in 1944, with valuations of $263,419 and $1,047,130 for the same years, respectively. The firm reported that heavy orders had been received for 1945 delivery.

Agstone, Sand, Gravel Producers Subject to Labor Standards Act

Producers of agricultural limestone, and crushed stone, sand and gravel, as well as other nonmetallic minerals find themselves covered by the Fair Labor Standards Act's provisions dealing with the payment of minimum wages and overtime, as the result of an interpretation recently issued by L. Metcalfe Walling, Administrator of the Wage and Hour and Public Contracts Divisions of the United States Department of Labor. This interpretation, which broadens the class of employees considered by the Divisions to be "engaged in the production of goods for commerce" within the meaning of the act, was adopted following the decisions of the federal appellate courts in the fourth, fifth and sixth circuits in the cases of the the *Hamlet Ice Company, Inc.*, the *Atlantic Company,* and *Chapman v. Home Ice Company,* respectively. Mr. Walling said:

> In the light of these decisions, it is my opinion that the Fair Labor Standards Act, in its application to employees engaged in the production of goods for interstate commerce, is not limited to employees engaged in the production[1] of goods for shipment across state lines. The courts have indicated that goods are produced "for commerce," even though they do not subsequently leave the state, if they are produced in order to supply the needs of interstate commerce, or to serve as an essential part of such commerce, or to aid or facilitate the carrying on of interstate commerce such as interstate railroads, highways, telegraph or telephone systems, pipe lines, airports, harbors, and the like. . .
>
> Employees must be considered engaged in the production of goods for interstate commerce when engaged within a state in such activities as producing ice, electric energy, railroad ties, crushed rock, bituminous aggregate, ready-mixed concrete, telephone and telegraph poles, or other similar items for use or consumption wholly within the same state by interstate railroads, telegraph or telephone companies, etc., in carrying on interstate transportation or communication; or for use or consumption within that state in the maintenance, repair, or reconstruction of essential instrumentalities of interstate trade, commerce, transportation, transmission or communication.

The principle of coverage embodied in this announcement reinforces the position taken in release R-1789, and supplements the Division's views expressed in previous opinions and publications, according to Mr. Walling. He added that in so far as the statements contained in Paragraph 6 of Interpretative Bulletin No. 1, in Paragraphs 2 and 10 of Interpretative Bulletin No. 5, and in release G-162 may reflect a narrower interpretation of production "for commerce," they should be regarded as modified by the latest announcement.

The new interpretation was adopted for enforcement not earlier than April 15, 1945, in so far as it broadens the classes of employees considered by the Divisions as being within the general coverage of the act, in order to give the industries affected an opportunity to study and appraise the effect of the changes and to plan any modification of their operating methods which may seem appropriate without the risk of governmental action based upon failure to comply with the Divisions' interpretation as now revised. However, this policy does not affect the independent right of employees under Section 16 (b) of the act to maintain their own suits to recover whatever compensation may be due them under the act.

In answer to an inquirer who asked: "Does the production and distribution of ground limestone to farmers entirely within the state of production fall within the purview of Section 3 (j) of the Fair Labor Standards Act?" the official reply was:

> We assume for purposes of this reply that the farmers to whom the ground limestone is sold produce goods which move across state lines. Limestone, as the irrigation water discussed in the Salt River Valley case, would appear to be "one of several proximate causes of vegetable growth". It would appear to be clear, therefore, that the production or distribution of limestone is so closely and intimately related to the production of other goods that move across state lines as to fall within the principles of the Kirschbaum and the Salt River Valley decisions. Accordingly, it is our opinion that employees engaged in connection with the production and distribution of limestone are engaged in an occupation necessary to production within the meaning of the Act.

[1][Employees "employed in producing, manufacturing, mining, handling, transporting, or in any other manner working . . . goods, or in any process or occupation necessary to the production thereof, in any state", are deemed to be "engaged in the production" of such goods within the meaning of the act. Fair Labor Standards Act, Section 3 (j).—Ed.]

O.P.A. Decision Given In Price Violation Case

In announcing an out-of-court settlement of a claim against the Caspar Stolle Quarry and Contracting Company of East St. Louis, Illinois, the Springfield Office of Price Administration warned other firms against charging over-ceiling prices. The Stolle company had been involved in a case concerning $361 charged for limestone.

A.E.D. to Follow Baruch Suggestions On War Surpluses

The Executive Committee of Associated Equipment Distributors at its semi-annual meeting in Washington, D. C., announced an important resolution passed on April 9. The A.E.D. deals with the distribution and manufacturing of equipment for the highway and roadbuilding industries. The committee voted to follow the recommendations of the Baruch report by confining distribution of billions of dollars' worth of war material surpluses to industry channels . . . in order to eliminate speculators and to "prevent a new crop of post-war millionaires from making fortunes on the products of industries with which they have never been identified . . . and to whose products they contributed nothing . . ."

The committee reaffirmed earlier recommendations to the Surplus Property Board for the appointment of an Industry Advisory Committee to cooperate with the board in the distribution of surplus in the construction machinery and equipment fields.

Industrial Silica Corp. Elects Coxey, Lemke

The Industrial Silica Corporation of Youngstown, Ohio, recently announced that Jacob S. Coxey, Jr. had been elected president of the company. Mr. Coxey succeeds the late L. M. Hansen. P. Grant Forman, vice-president and works manager, will assume Mr. Coxey's former duties as first vice-president in charge of operations. Other appointments were as follows: A. C. Lemke, secretary-treasurer; R. S. J. Raney, board chairman (reappointed); C. F. Eberhart, assistant secretary.

Gailor Stone Company Bought by L. A. Baldwin

Leo A. Baldwin, purchasing agent for the division of United Aircraft Corporation, Pratt & Whitney Aircraft, recently purchased the Gailor Stone Company, Inc., of Saratoga Springs, New York, including a limestone quarry and all equipment. Mr. Baldwin, a veteran of World Wars I and II, plans to make his firm an all-veteran organization; he proposes to enlarge the firm's facilities in order to meet post-war trade demands.

N.C.S.A. Announces New Agstone Division At Cincinnati Meet

At a meeting of 23 producers of agricultural limestone, held at the Netherland Plaza Hotel, Cincinnati, April 5 and 6, the Agricultural Division of the National Crushed Stone Association was born. Its formation had been authorized previously by the executive committee of the national body. The new division will have autonomy as to the management of its affairs, subject only to the articles of incorporation and by-laws of the association. A program of the activities to be engaged in is being prepared by a drafting committee elected by the producers present and will be announced later.

Henry A. Huschke, for many years connected with the National Lime Association and an expert in the promotion of liming materials—in more recent years he has been with the Office of Price Administration in Washington—has been employed as a full-time staff man and will assume his new duties June 1.

A board of directors, an executive committee and a chairman were elected for the period between now and the time when O.D.T. regulations will permit an industry-wide meeting of agricultural-limestone producers. Howard M. Thomas, president of the Fort Scott Hydraulic Cement Company of Fort Scott, Kansas, was elected interim chairman of the division.

Another committee elected at the meeting is engaged in preparing a pamphlet describing the activities in which the division will engage and the basis on which it is proposed to finance the project. A board of directors of the division has been elected but its members can not be named until confirmation has been received.

For the present at least headquarters of the division will be maintained at the Washington office of the national association.

The following producers and members of the association staff were present:

Harry Battin, Callanan Road Improvement Co., South Bethlehem, N. Y.
W. L. Bryan, W. J. Bryan & Son, Red Wing, Minn.
W. N. Carter, National Stone Co., Joliet, Ill.
Paul I. Detwiler, New Enterprise Stone & Lime Co., New Enterprise, Pa.
Earl Dingle, Harry T. Campbell & Sons Co., Inc., Towson, Md.
James Eells, Basic Dolomite, Inc., Cleveland.
Otho M. Graves, General Crushed Stone Co., Easton, Pa.
E. E. Haapala, Zumbrota, Minn.
W. L. Heckathorn, Stuntz & Yeoman Lime Quarries, Delphi, Ind.
Philip E. Heim, Carbon Limestone Co., Youngstown, O.
R. P. Immel, American Limestone Co., Knoxville, Tenn.
E. J. Krause, Columbia Quarry Co., St. Louis, Mo.
Verne C. Morgan, Kentucky Stone Co., Louisville, Ky.
Floyd Mumma, Midwest Agricultural Limestone Institute, Decatur, Ill.
Paul M. Nauman, Dubuque Stone Products Co., Dubuque, Ia.
Ivor Nielson, Hector Construction Co., Hector, Minn.
Russell Rarey, Marble Cliff Quarries Co., Columbus, O.
A. B. Rodes, Franklin Limestone Co., Nashville, Tenn.
C. M. Sims, Campbell Limestone Co., Gaffney, S. C.
O. M. Stull, Liberty Limestone Corp., Rocky Point, Va.
Howard M. Thomas, Fort Scott Hydraulic Cement Co., Fort Scott, Kan.
D. L. Williams, Virginian Limestone Corp., Ripplemead, Va.
W. F. Wise, Southwest Stone Co., Dallas, Tex.
J. R. Boyd, National Crushed Stone Assn., Washington, D. C.
Henry A. Huschke, Washington, D. C.

Basic Refractories, Inc. Announces Plant Changes

Basic Refractories, Inc., of Cleveland, Ohio, reports a 1944 operating profit of $409,049. The company operates brucite mines and a plant in the Gabbs Valley section of the Mammoth mining district in Nevada.

Brucite shipments to the Maple Grove, Ohio, plant are reported between 500 and 600 tons per month. More equipment was installed recently, and the management is said to be planning the construction of a calcining plant when the manpower and material situation improves.

Columbia Quarry Co. Orders 4 Earth-movers

At the Columbia Quarry Company plant at Krause, Illinois, four new earth-moving units were ordered to dispose of the overburden. Two Le Tourneau Tournapulls with 14-cubic-yard Carryalls will be used to haul the topsoil, up to 25 feet in depth; and two similar 12-cubic-yard rock wagons will handle top rock, which has a maximum depth of 55 feet.

W.P.B. Estimates Construction Material Requirements for 1945

Estimates of quantities of materials required for public and private construction in the United States in April, 1945, and for the year 1945 were released recently by the War Production Board.

The estimates have been made on the assumption of a full-scale war (that is, in both Europe and the Pacific), the W.P.B. said, and consideration has been given to the extent to which other materials have been used as substitutes in construction.

Materials for which data are given are asphalt, building blocks, building boards, brick, cast iron (including that in pipe and fittings, radiators, boilers and bathtubs), cement, copper, gypsum board, lead, lumber (including millwork, flooring and prefabricated units), roofing (exclusive of non-asphaltic roofing such as metal, slate, wood, asphalt-coated insulation board), sewer pipe, carbon and alloy steel, steel plate, structural tile and zinc.

Estimated consumption in April and estimated consumption for 1945 follow:

	March, 1945	April, 1945	1945	
Asphalt	98,000	100,600	1,165,200	short tons
Building Blocks	18,200,000	17,800,000	220,000,000	blocks
Building Boards	78,000,000	81,000,000	911,000,000	square feet
Brick	140,700,000	138,600,000	1,628,000,000	bricks
Cement	5,873,000	7,662,000	89,400,000	barrels
Gysum Board	159,000,000	137,000,000	1,740,000,000	square feet
Roofing Materials	5,350,000	5,011,000	59,128,000	squares
Sewer Pipe	57,200	59,800	725,000	long tons
Structural Tile	66,600	69,100	702,000	long tons

A detailed breakdown of estimated consumption in four categories—military, war plant expansion, civilian housing and all others—is given in *Facts for Industry*, Series 50-5-2, "Quarterly Summary of Materials Consumption for New Construction in the U. S.," copies of which are available from the Bureau of the Census. The report also gives data on estimated 1945 consumption broken down into quarters, and consumption in March, 1944, January, 1945, and February, 1945.

At Cold River, New Hampshire, the feldspar mining plant of Cold River Minerals, Inc., was destroyed recently by a $60,000 fire. The plant was leased to the local firm by General Mills, Inc., of New York.

The Aluminum Company of America reported a new development laboratory at East St. Louis, Illinois, for the study of further uses of low-grade bauxite ores.

WASHINGTON NEWS LETTER

another P-Q exclusive

THE death of President Roosevelt cast a great shadow over the entire nation. At the time of this writing the initial shock and incredulity have passed and the new chief executive has already undertaken his tremendous responsibilities. The Presidential office became such a powerful, highly personalized agency in the hands of Mr. Roosevelt that the widespread public concern over the abilities and policies of his relatively little-known successor was entirely understandable. To the vast majority of the American people, even to many of those who differed with his programs, the late President was a mountain of strength and a source of light and understanding in a world in which the forces of brutality and evil aimed at nothing less than the total enslavement of modern civilization. To the common people he offered more than inspiration and hope; he gave courage and capable and resourceful leadership when it was most needed, first through the trying years of the depression, then in the crucial period of the war against Fascism. Perhaps most important of all, he gave force and direction and guidance to the common desire for effective international coöperation as the fundamental means for preventing future wars.

* * *

In the first days of his new job, Mr. Truman has given every indication of awareness of the difficult burden which has been thrust upon him. Innumerable problems lie ahead: in the military sphere, fighting the war on both fronts to a successful and uncompromising conclusion; on the international level, underwriting a durable peace and establishing the world-security organization on a firm foundation; at home, turning our immense productive capacity to the output of civilian goods and services in such a way as to continue the high levels of employment achieved during the war. These are no mean tasks, especially for one with little administrative or executive experience. Yet Mr. Truman brings to the toughest assignment in America other qualifications which should prove extremely useful. It is to his credit that he recognized unhesitatingly the doubt and uneasiness in the minds of most people concerning the shifts in policy which might occur as a result of his succession to the Presidency. His initial address to the Congress, within four days of his taking the oath of office, was primarily designed to reassure the public and allay such fears, and in general, his speech, delivered quietly and sincerely, had the desired effect. Obviously, however, general statements are an inadequate criterion of policies; judgment must be reserved until the new President has had sufficient opportunity to clarify his position on specific issues.

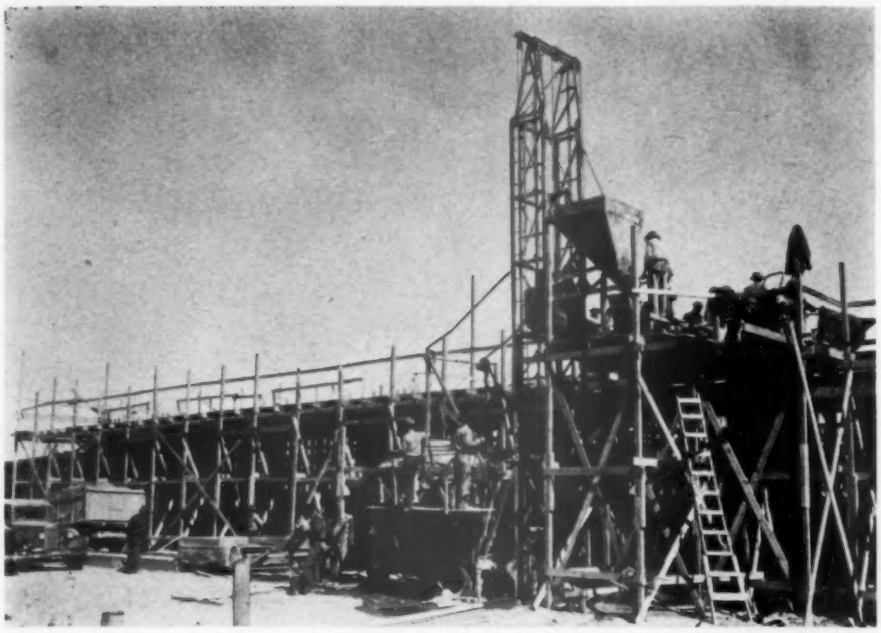
Mr. Truman's most valuable asset springs from his former service in the Senate and, if handled successfully, should enable him to win the acceptance of the vital measures which even under Mr. Roosevelt were by no means assured. The *modus operandi* of the new President will be an extension of the approach recognized by his predecessor during the last few months as both necessary and desirable—to work closely with both houses of the legislature, particularly the Senate, on all important matters of national policy, seeking their advice, anticipating their objections, and, in general, finding some satisfactory middle ground which does not do violence to basic objectives. Such a method has obvious advantages, but it is fraught with many dangers as well. If carried too far, compromise can become appeasement. Legislative representatives are naturally responsive, sometimes in the extreme, to pressure groups whose interest is not necessarily the same as, and in fact is often opposed to, the public interest. Furthermore, many strategic committee assignments in both Houses are held by individuals antagonistic in principle to many of the domestic and foreign policies to which Mr. Truman has pledged adherence. In any case, it is certain that the close working relationships between the President and many of his former colleagues must and will be broadened and strengthened. No one sees more clearly than Mr. Truman that he can function successfully only if he obtains satisfactory coöperation from the legislature. The eloquent plea for such coöperation contained in his first address reflects his strong feelings on this subject: "You, the members of the Congress, surely know how I feel. Only with your help can I hope to complete one of the greatest tasks ever assigned to a public servant. With divine guidance, and with your help, we will find the new passage to a far better world, a kindly and friendly world, with just and lasting peace. With confidence, I am depending upon all of you."

* * *

It remains to be seen how far this desire for unity will be carried. There is considerable speculation in Washington concerning the establishment of a "coalition government", principally through shifts in the Cabinet, but such a change would have little meaning of itself. It will be remembered that in 1940 Mr. Roosevelt set up a "coalition" Cabinet by appointing Republicans Stimson and Knox to the War and Navy Departments, yet official policies remained unchanged. Coalition at the present time would be important only to the extent that Administration policies were seriously compromised. One of the most controversial set of problems which must be faced concerns the way in which the reconversion of the economy from war to peace is to be handled. Fortunately, as Chairman of the Senate Special Committee to Investigate the National Defense Program, Mr. Truman was in very close contact with plans and preparations for the reconversion period. In fact, the Truman Committee was an outspoken critic of the long delay of various government agencies in the formulation of reconversion plans, and was a powerful influence leading to the establishment of the Office of War Mobilization and Reconversion, charged by statute with the integration and coördination of government plans for reconversion. This experience will stand the President in good stead, for most of the pressures he will have to resist or reconcile, so far as domestic policies are concerned, will relate to questions in this field. It is a little premature to predict what course he will follow.

Plans are under way for the study of Arkansas resources at five laboratories of the University of Arkansas in Fayetteville. Wood products, food processing, clay and ceramics, rock (particularly cement and marble) and water resources will be investigated.

AGGREGATE AND CONCRETE PRODUCTION FOR DESERT ROCKET-TESTING STATION



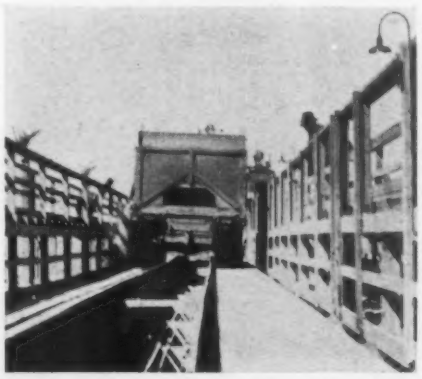
One of seven portable mixing plants which mix and elevate concrete at Inyokern. A dry-batch truck is at left.

another P-Q and exclusive

INYOKERN, CALIFORNIA — a desert cross-road community with an official population of only 28 inhabitants a little more than a year ago is now the headquarters of a huge war-time development, the United States Naval Ordnance Test Station—the Navy's rocket-testing center for the Pacific. Its population has increased to nearly 15,000 including both naval personnel and civilian workers. Millions of dollars have already been spent in its development and more millions remain to be expended before it reaches completion. Inyokern is to be a permanent institution and its structures are being built to last.

• Right: Conveyors leading to washing screen and No. 3 concrete batching plant.

• Below: Side-dump truck unloading pumice into storage bins.



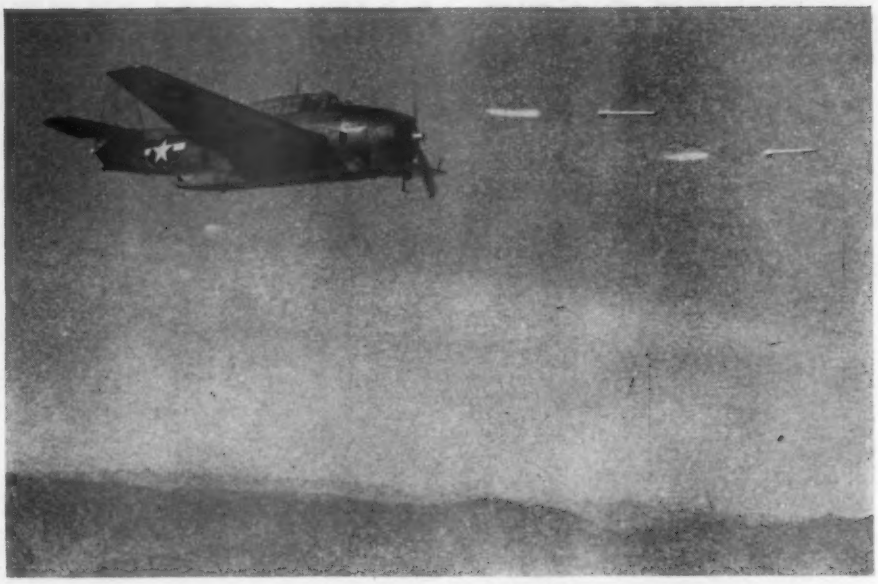
Already, however, it is serving its purpose, the scream of rockets under test breaking the centuries of stillness of the desert air at intervals, while the machines of construction rumble steadily on, converting a trackless waste of 1,025 square miles of desert into a proving ground for these modern man-made missiles of death.

For nearly a year now three of California's leading heavy-construction firms—the Macco Construction Company, Morrison-Knudsen, and the E. S. McKittrick Company—have pooled their resources and efforts on the project. They have encountered many obstacles—the lack of water, the desert heat, the absence of roads, the recruiting, housing and feeding of an army of workmen—but these have all been surmounted and work on what is probably the largest construction site ever laid out is proceeding on schedule.

By HARRY F. UTLEY

The Inyokern station lies in the Owens Valley in the counties of Inyo, Kern and San Bernardino and is sandwiched between the Mojave Desert and Death Valley. By drilling deep wells and tapping the old Los Angeles Aqueduct water supplies are now adequate, although much of it must necessarily be transported by tank trucks over the 200 miles of roads already paved or surfaced within the limits of the station.

Prospecting for a suitable sand-and-gravel deposit was one of the first steps undertaken and an area with an unlimited supply of well-proportioned, desirable material was selected in the Indian Wells Valley



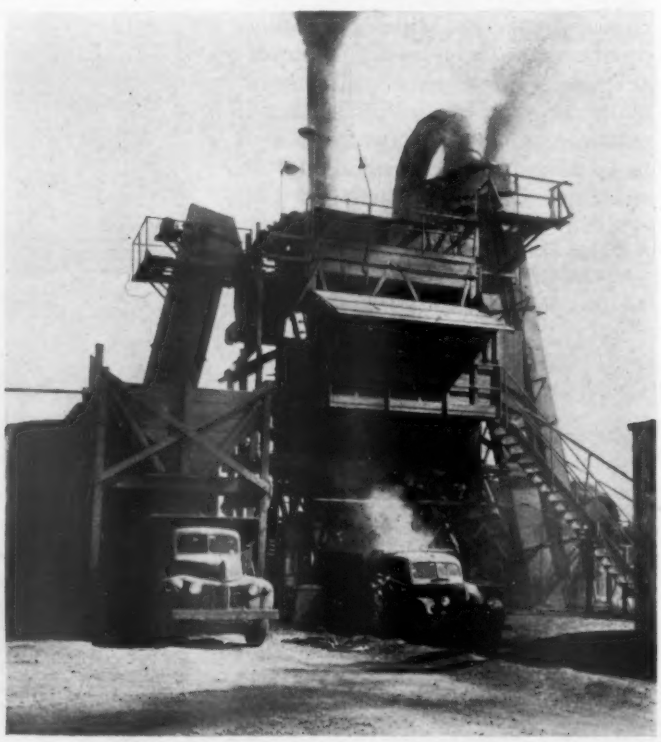
Left: Tractor and bulldozer working in aggregate storage at No. 3 batching plant. Right: A Navy T.B.F. torpedo bomber fires rockets at a distant mountain on the target practice range of the U. S. Naval Ordnance Test station at Inyokern. (Official U. S. Navy photo.)

about 16 miles from station headquarters. Two Northwest Model 80 shovels—one powered by a gasoline engine and the other a Diesel one, each equipped with a 2-cubic yard bucket excavate the material and load it into dump trucks which carry it to two portable crushing-and-screening plants. Bowlders over 8 inches in size are rejected at the plant-hopper grizzlies.

One of these plants is a Diamond unit owned by the Macco company and the other a Cedarapids, owned by Morrison-Knudsen. Each is driven by a Caterpillar 8-cylinder Diesel engine. Both plants are operated to obtain maximum production, leaving the final sizing to be done separately by three Symons double-deck screens. About 40 per cent. of the coarse material is crushed. Some sand is taken out by the portables and the remainder at the sizing screens. No attempt is made to wash the material at the plants because of the lack of water. Although the rated capacity of the two plants is less than 200 tons per hour, by sizing the material separately and allowing the portables to concentrate on the job of crushing, a maximum total output of about 350 tons per hour is being maintained, according to Superintendent Harry A. Bambauer. Motor-generator sets supply electricity for lighting and for power to drive the screen and conveyor motors. When necessary, operations continue day and night around the clock.

The sized, but as yet unwashed, aggregate is carried to the rocket-testing station in a steady parade of dump trucks, the vehicles seldom being over ¼ mile apart, and traveling over a gravel road built and maintained by the contractors. It is delivered to three washing-and-batching plants located at strategic points many miles apart to serve the needs of construction. These plants proportion cement and aggregates into dry-batch trucks as well as into the 17 truck-mixers (of varying sizes, models and makes) used on the project. Aggregates are also supplied to a hot-mix bituminizing plant

Left: View of No. 3 batching plant showing a truck-mixer loading. Right: Hot-mixed bituminizing plant which has paved and maintained much of the 200-mile road system at Inyokern.



A 2-cubic-yard shovel loading a truck in the gravel pit in Indian Wells Valley.

which prepares material for building and maintaining station roads.

Batching Plant No. 3, similar to the other two units but handling a lightweight pumice aggregate as well, is worthy of mention, and a brief description of its operation will give the reader a picture of this phase of the production scheme.

The sand-and-gravel is dumped from the trucks into a series of hopper-bottomed storage compartments separated by concrete walls, each size going into its proper compartment. The materials are then pushed by a bulldozer to manually-controlled gates in the bottoms which regulate their flow onto a 36-inch tunnel-reclaiming belt-conveyor. This is followed by a 24-inch belt on the incline to the washing screen, the combined center-to-center length of the belts being 260 feet. The screen, a Symons 2-deck 4- by 12-foot unit, is equipped with washing sprays, the water being delivered at 180-pound pressure to insure thorough cleaning of the gravel and sand, all of which passes the ¾-inch top deck or the $\frac{3}{16}$-inch bottom deck of the screen. The unit performs no sizing function, passing the washed material to the main 24-inch by 165-foot belt-conveyor beneath. This belt carries the now completely-processed aggregate up to the batching-plant bin.

The light-weight aggregate is trucked a distance of 81 miles from the Coso Junction plant of the American Pumice Company of Los Angeles. It is a blend of minus-¾-inch material. The side-dump trucks climb a ramp at the batching plant and discharge their loads into a series of four elevated bins, arranged in line alongside the sand-and-gravel hoppers mentioned above and each having a capacity of about 800 tons. The empty trucks leave by an exit ramp at the far end of the bins. Spray pipes arranged along the tops of the bins keep the pumice wet to facilitate handling and equalize its specific gravity for batching by weight. A conveyor beneath the bins brings the pumice out and puts it on the same 165-foot plant conveyor which transports the sand and gravel up to the batching plant.

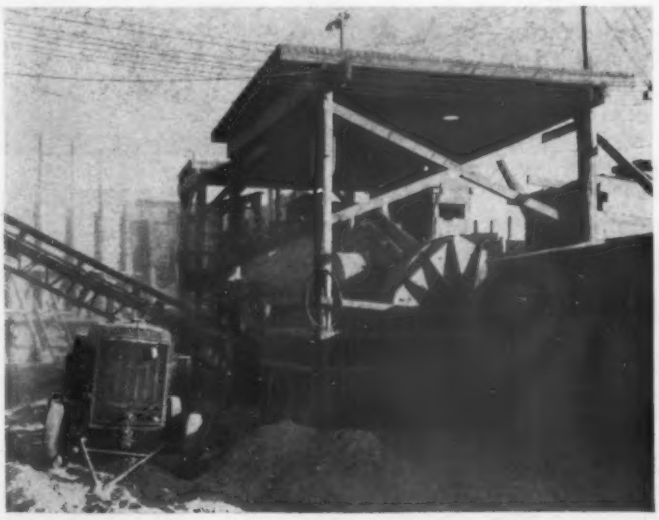
The compartment bin at the plant has a capacity of only 26 cubic yards and, as a result, the belts are running almost constantly while material is being batched into the trucks and truck-mixers. Starting and stopping of the belts are controlled by push-buttons from the batching-plant floor. The Noble batcher has five scale beams for weighing out the different ingredients, aggregates being released by hand-operated levers and the cement automatically by electric-eye control. Bulk cement is used, it being stored in two Noble 500-barrel steel tanks. Trucks bring the cement to the plant where it is fed to the tanks by a screw conveyor and bucket elevator and to the batcher by a screw-conveyor.

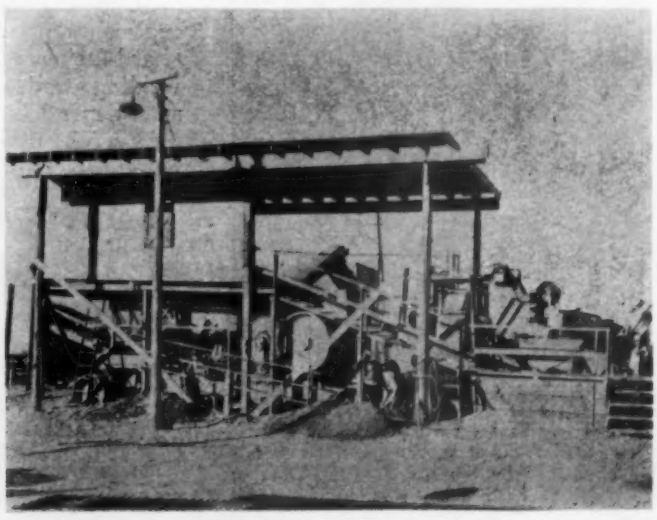
The 5-beam scale at No. 3 batching plant. Four levers are for releasing aggregates; top beam for cement is controlled by a photo-electric cell.

The source of cement supply from which the trucks are loaded is a 1,500-barrel capacity master silo which is filled by a Fuller-Kinyon pneumatic-conveying system from

(*Continued on page 72*)

Left: Portable crushing and screening plant. Compressor provides air for cleaning the plant. Right: Another portable crushing plant which helps to produce huge quantities of aggregates.





PROTECTION THROUGH HARD-FACING; PRINCIPLES, USES AND PROCEDURES

● Applying hard-facing rod by the electric-arc process to build up a worn shaft.

By W. WESLEY MILLS

Director of Research,
Mir-O-Col Alloy Company

another P&Q exclusive

HARD-SURFACING as a practical means of protecting all types of steel equipment from excessive wear is proving of great value in many of the heavy industrial operations of the pit and quarry industries. Cement-plant superintendents, for example, are confronted with numerous maintenance problems because nearly all cement equipment—from the churn drill which bores the blast holes to the conveyor that carries the finished product to storage bins—is subjected to incessant abrasive wear. This causes frequent replacements or repairs, with consequent delays in production schedules.

● Excavating and handling equipment in the quarry is subject to severe abrasion and wear. Bucket teeth, as well as crawler treads, pins and links, can be made to last much longer by the proper application of hard-facing metals.

To-day the cost of shut-down time is no longer a mere matter of dollars and cents. In these war-time days of replacement shortages, the importance of keeping each wearing part in longer continuous operation can not be emphasized too greatly.

Many plant operators know from experience that hard-surfacing—or "hard-facing," as it is called in the welding trade—is the easiest and most dependable means of extending the useful life of wearing parts employed in crushing, screening, and conveying operations.

Briefly stated, hard-facing consists of welding a hard, wear-resistant alloy to the surface, edge, or point of any steel part which is continually subjected to abrasion, impact, and high frictional heat. The hard-facing can be applied easily by either the acetylene or electric-arc process.

In quarrying operations there are many typical uses for hard-facing as a wear-resistant protection. Various equipment parts which can be hard-faced profitably for longer life and less frequent repair include drill stems and wrenches, grousers and sprockets, churn drills, bulldozer blades, tractor rollers, shovel teeth, bucket lips, runners, wear plates and latch pins. Common applications of hard-facing in the cement mills themselves include everything from a gyratory crusher to a ring-roll mill.

The benefits derived from hard-facing are almost limitless in the gravel, crushed-stone, and other nonmetallic-mineral industries. In many operations involving the movement or conveyance of gravel, sand, and earth-bearing minerals, the margin of profit is so small—and the production cost per ton so great—that every minute of time lost is of vital importance.

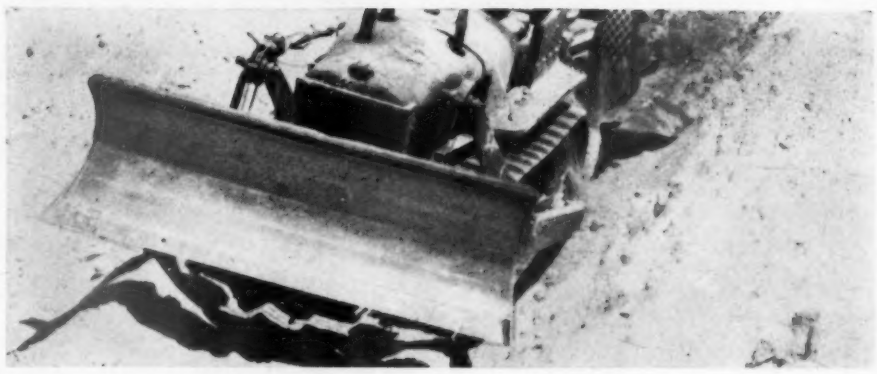
Uninterrupted production is the goal of every contractor and producer. Hard-facing not only prolongs the life of parts many times, but actually reduces the number of replacements necessary, with resultant savings in lost production time. The battle for increased production

● This drag-line bucket performs at peak efficiency with its digging teeth made sharp and almost wear-proof through hard-facing.

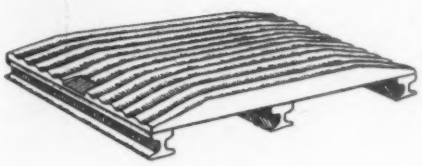
can not be won when equipment is shut down for replacement or repair.

Still another benefit is derived from hard-facing when it is applied to edged tools or to such equipment parts as bulldozer blades, scrapers, plows, shovel-dipper, dragline and crane bucket lips, or any part where a sharp edge increases operating efficiency. Since the parent metal underneath the hard-facing will wear away faster than the hard-facing itself, the cutting or scraping edge automatically will stay sharp. In many cases this also reduces power costs, in addition to eliminating the need for frequent sharpenings.

Hard-facing can be applied both to old and new parts. It will restore worn parts to better-than-original utility, and in some cases it is applied to new parts before they are ever placed in service. In either instance, the life's wear of the equipment is greatly prolonged; shutdowns are held to the minimum; and the cost of production—in terms of cost per ton, per barrel, or other unit of measure—is materially reduced.



● Bulldozer and scraper blades are made wear-resistant by hard-facing the leading edges.



● To prevent warping of crusher jaw plates, it is a good idea to weld rails to the back of the jaws before applying the heat. Afterward the rails may be removed with a torch and the resulting rough surface can be ground smooth again.

In the early days of hard-facing, unsatisfactory results were sometimes obtained due to lack of experience in hard-facing technique on the part of welders. Other obstacles at first included (1) the high cost of hard-facing alloys; (2) incorrect thickness of application of the hard-faced deposit; and (3) lack of knowledge of the requisite contents of a successful hard-facing metal alloy. Even to-day the average welder takes it for granted that hard-facing is just another welding job, requiring the same technique as in steel welding. If the welder uses his familiar steel-welding technique and obtains a finished hard-facing job that is rough and porous, or full of checks and slag holes, it is only natural that he may think the manufacturer of the hard-facing rod has failed to use the proper combination of alloys in the rod. Or he may conclude that the flux coating of the rod is incorrect.

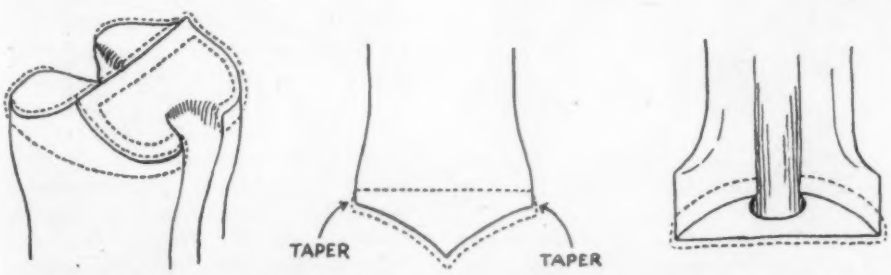
The technique of correctly applying hard-facing is not the same as in steel welding and there are varying types of abrasion, plus other factors such as heat, corrosion and impact, which often are involved in combination with abrasion. For that reason it is necessary to understand just what constitutes a good hard-facing metal to obtain maximum service from every hard-facing application.

In the first years of hard-facing very little was known about abrasion, and a hardness of approximately 55-60 Rockwell C scale was considered the yardstick for a suitable hard-facing metal. This degree of hardness was adequate to resist abrasion, but when applied on surfaces where heavy shock or impact was encountered, this type of metal would fracture or disintegrate.

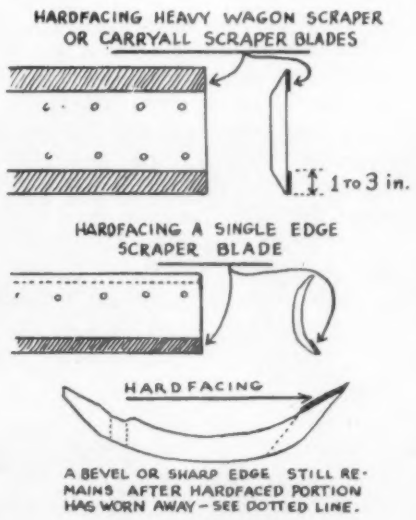
To increase the "toughness" or ductility of the hard-facing alloy, the manufacturer at that time was required to sacrifice some of the hardness in his product, and the Rockwell C hardness was dropped to about 35-44. Of course, the abrasion resistance of the alloy became proportionately lower.

Hardened steel or iron loses its hardness when subjected to high heat and will gall rapidly under surface friction. When it became apparent, early in the machine age, that all frictional surfaces produce enough heat to reduce the surface hardness of iron and steel, a hard-facing alloy then was needed that would be rigid or tough and yet would resist abrasion as much at red heat as when cold.

From the beginning of hard-facing some metallurgists were of the



● Dotted lines indicate where the hard-facing is applied to a churn-drill. The bit should first be heated to about 700 degrees F., however.


HARDFACING HEAVY WAGON SCRAPER OR CARRYALL SCRAPER BLADES
1 TO 3 in.
HARDFACING A SINGLE EDGE SCRAPER BLADE
HARDFACING
A BEVEL OR SHARP EDGE STILL REMAINS AFTER HARDFACED PORTION HAS WORN AWAY - SEE DOTTED LINE.

● When hard-facing the edges of scraper blades, a wide band of the metal should be applied—from 1 to 3 inches.

opinion that a hard-surfacing rod could be engineered that would have a deposited Rockwell C scale hardness of 54-57, plus a high red hardness, with sufficient toughness to withstand the severe impact such as encountered in crushing equipment without disintegrating. This type of hard-facing could then be deposited to any thickness desired on an equipment part to give additional service life without fear of failure.

After many years of research metallurgical engineers have alloyed a hard-facing rod that is designed to be used for a wide variety of general purposes. The hardening properties are in the form of metal carbides in sufficient quantities to give extreme rigidity to the deposited hard-facing, with high resistance to galling and to abrasion at the same time. Its resistance to abrasive action is as great at red heat as it is when cold.

The best combination of elements to obtain these qualities must include two metals of the chromium group, in conjunction with either nickel, cobalt, or iron. The carbon content should be above 3.75 per cent. in a carbide form. This type of alloy will melt at a lower temperature and will remain fluid longer than steel. When applying it on the surface of steel, with either the acetylene or electric process, the welder must consider (1) the volume of the piece of steel being hard-faced; (2) the transmission of heat through the steel; and (3) the melting point of the steel, which is higher than that of the hard-facing rod.

When the electric process is employed, the welding machine should be set high enough to turn the welding rod a dull red its entire length. This will melt the surface of the parent metal with a superheated flow of hard-facing metal from the electrode. An oscillating motion is recommended to keep the hard-facing deposit in the fluid stage long enough to melt the entire surface of the steel that is covered with the arc. In addition, a long arc must be used to keep the metal fluid long enough to form a perfect bond and to float all impurities to the surface.

When using the acetylene process, the article to be hard-faced should be preheated to a dull cherry-red color before applying the oxy-acetylene torch. This is recommended so that when the surface of the steel reaches the melting point, the transmission of heat will be slow enough to allow the hard-facing to flow into the molten surface and remain fluid long enough to release all trapped oxides and gases.

The thickness of the deposit will determine the amount of additional life's wear to be obtained from the hard-facing application. The thicker it is applied, the longer it will last. No one can expect a skin-thickness of hard-facing deposit to outwear an inch of hardened steel. But an adequate hard-facing application will give from three to twelve times the service life of iron or steel, depending on the type of steel with which it is compared.

A conservative estimate is that hard-facing will outwear high-carbon steel about three times. It will outwear mild steel about ten times. Other metals which can be hard-faced include low alloy steels, manganese steel, stainless steel, cast iron, and alloy cast iron.

To double the service life of a machine part is sufficient to pay for the cost of hard-facing. But the real economy of hard-facing is in the continuous and uninterrupted operation which is made possible with wear-resistant, hard-faced parts. The continual production obtained, with peak operating efficiency, is always worth far more than the cost of the hard-faced part.

Inyokern *(from page 69)*

special bulk-cement cars which arrive over a spur track of the Union Pacific Railroad.

The largest gravel used is 1¾ inches in size and with it are used two grades of sand. A wide gradation of batched materials is possible and the batching plant regularly delivers a half-dozen or more different specifications daily to suit the varied needs of the construction work. George Harris supervises the operation of the batching plants for the contractors.

Because of the tremendous area included in the station and the fact that the concrete work was so widely spread out, plus the need for elevating large quantities of the concrete, Mixermobiles have played an important part in preparing the concrete mixed on the job. According to engineers and field superintendents, these machines have made it possible to mix and distribute concrete on the far reaches of the project with top efficiency. The dry-batch trucks dump the batches into a skip which charges the mixer on the mobile unit. After the prescribed time of mixing it is discharged into a bucket which can be elevated to the top of the steel tower, discharging the concrete at heights up to 50 feet. Tank trucks bring the water to the Mixermobiles. The Security Materials Company, Los Angeles, ready-mixed-concrete producer, is a pioneer operator of Mixermobiles in southern California and sold the first Mixermobile to the Navy for use at Inyokern, according to C. C. McWilliams, vice-president. Now there are seven such units on the job, along with several Wagner Buggymobiles. The Buggymobile is an efficient 3-wheeled power buggy for distributing concrete on ground pours from the Mixermobile or from the truck-mixer. Like the Mixermobile, the Buggymobile is manufactured by Mixermobile Manufacturers, Portland, Oregon.

The hot-mix plant which supplies bituminized aggregates for building and repairing the vast network of roads is a type D 3,000-pound-capacity all-steel unit. It is compact in arrangement and was built and supplied complete with elevators, rotary drier, screen, dust-collecting system, etc., by the Standard Steel Corporation of Los Angeles. It is able to deliver 80 batches per hour into the waiting trucks without difficulty. The asphalt plant is located along the spur track near station headquarters and receives its bitumen and fuel oil in railroad tank cars. Alongside is the master cement silo previously mentioned.

The Inyokern project is divided into areas of which there are now about 20, each of which is an extremely large project by itself. About 7,800 workmen are employed in construction alone. Besides, there is the naval personnel and staff members of the California Institute of Technology, Pasadena, which institution by the way has done a magnificent job in the testing and development of the rockets, rocket bombs and other items of ordnance.

The station is located at 2,250 feet elevation. Over 30,000,000 board feet of lumber has been used to date. More than 137,000 cubic yards of concrete had been poured by late February with many thousands of yards still to be produced. S. J. Mayo is resident chief engineer for the contractors. Commander D. E. Rockwell is the naval officer in charge of construction. Lieutenant-Commander R. E. Jenkins is his assistant. The commanding officer of the station is Captain Sherman E. Burroughs, Jr., with Commander John O. Richmond, USN (Ret.) serving as his executive officer.

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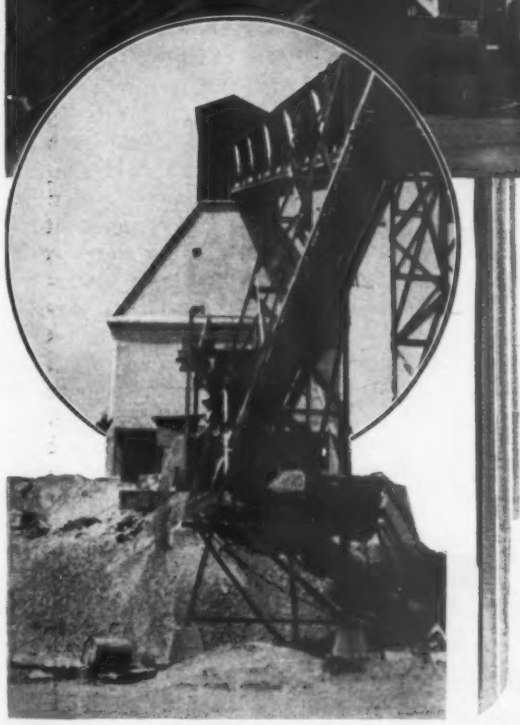

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Developments in the Manufacture of Better Refractories for the Portland Cement Industry*

—By LEOPOLD TSCHIRKY
General Refractories Company

Part Six (Conclusion)

another P and Q exclusive

UP to this point only passing reference has been made to kiln hoods, clinker chutes, clinker coolers, dust-collecting chambers, waste-heat boilers, stacks and driers, all of which require refractory linings. In varying degree of severity each of them has its own refractory problem, although decidedly less severe and less complicated than that encountered in the kiln. Seldom are their refractory problems troublesome except occasionally in either kiln hoods or coolers, or both.

In kiln hoods, especially those that are tightly sealed to the kiln, the problem frequently resolves itself into one of the design of the hood as much as one of refractories. Fusion, slagging and spalling are the principal causes of refractory failure in kiln hoods and much that has already been said on those subjects applies to the refractories problems encountered in kiln hoods in exactly the same manner it does to the problems encountered in the high-temperature zones of the kiln itself.

In addition to features of design that involve the inner face, top and sides of the kiln hood as related to the kiln itself, attention should be given to the thickness of the refractory lining. Dependent on the grade of refractory used and the temperature it will be subjected to, there is a limit to kiln-hood lining thickness beyond which additional thickness is ineffective and lost early in the run. This is well illustrated by the experience of a plant where kiln hoods built of first-quality fire-clay bricks fused, or slagged away, so rapidly that excessive repairs were necessary in less than three months' time. In an effort to improving this service the thickness of the kiln hood lining was gradually increased until it reached a thickness of 40 inches in the lower half and tapered to 31 inches at the top. However, as lining thickness increased the insulating effect also increased with the result that lining life did not improve; in fact, at times, it was less than before. The increased insulating effect of the thicker lining, plus clinker dust in the presence of the hot face of the lining at high temperature, caused rapid fusion until the lining became thin enough to benefit by the cooling effect from the outer face. Finally 13½-inch thick kiln-hood linings were installed and lining life increased immediately.

What was said earlier on the subject of fusion and slagging effect of Portland-cement clinker in the presence of refactories at high temperatures applies to the selection of refactories for kiln-hood lining in much the same manner as it does to the selection of refractories for burning-zone lining. This accounts for the satisfactory results some plants obtain from kiln hoods built of high-alumina bricks.

The matter of bonding material for laying up the bricks in the kiln hoods (and frequently in other linings, too) is also deserving of attention. Depending upon the severity of service expected, the bricks are usually laid up using etiher fire-clay or high-temperature cement. The use of a good bonding material and a poor one is shown in Figures 28 and 29, respectively. Figure 28 illustrates the interior of a kiln hood where the bricks were laid up with a good grade of high-temperature ce-

*Presented before the Technical Committees, Portland Cement Association, September 19, 1944.

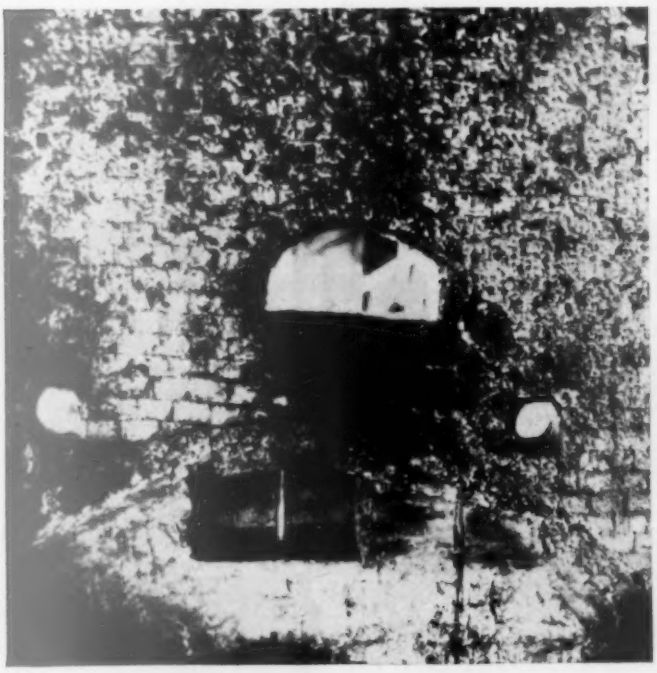

Figure 28

Figure 29

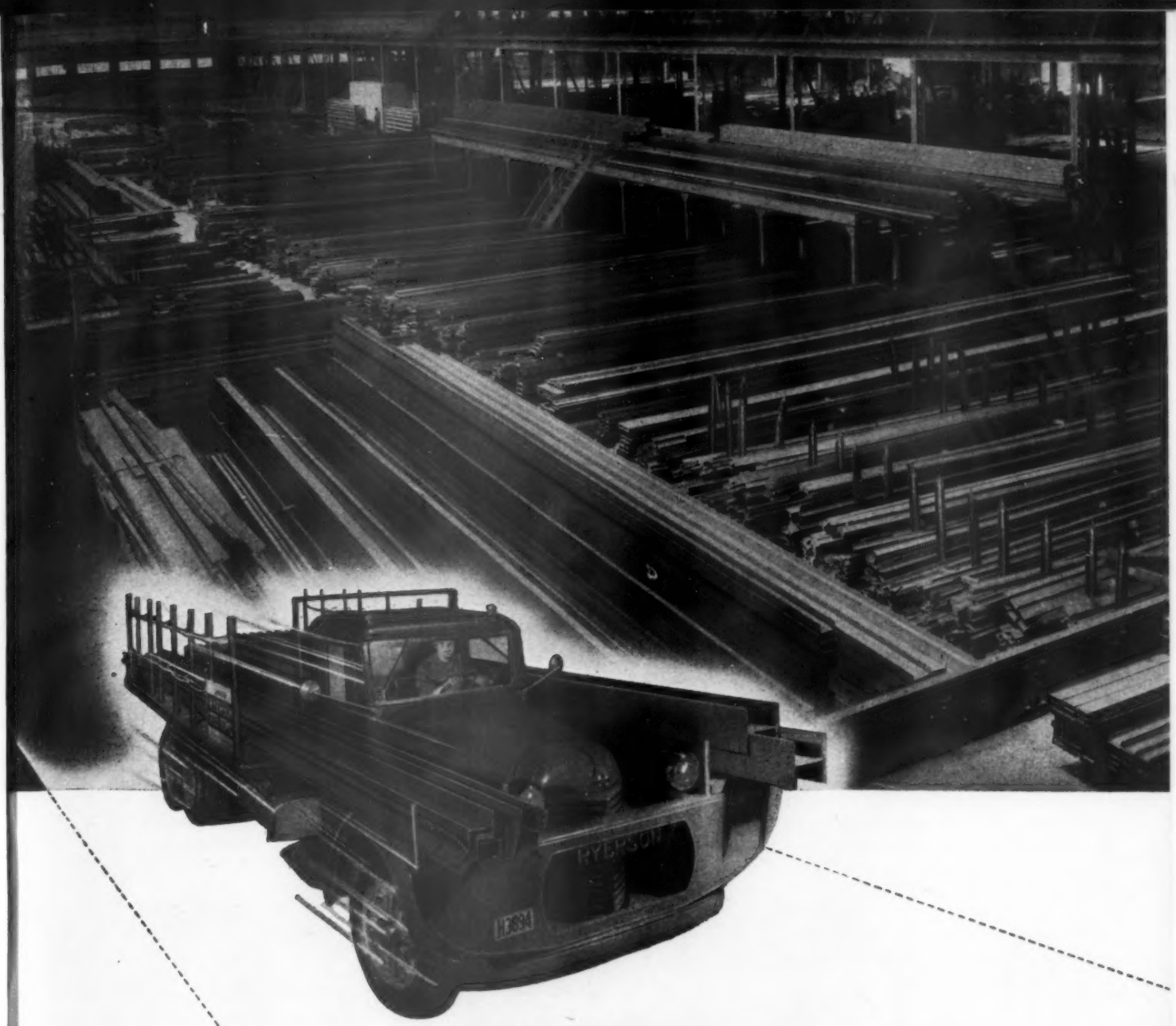

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Figure 30

Figure 31

ment. The hood had already been in service for two years and was ready to return to service without requiring any repairs whatsoever, whereas prior to using this high-temperature cement it was common practice in this plant to rebuild kiln hoods once a year. It will be noted that the high-temperature cement joints are all in good condition and afford the bricks good protection. Figure 29 illustrates the interior of a kiln hood where the bricks were laid up with a poor grade of bonding material. This hood had been in service less than a year. The bricks used were of the same grade as those used to build the hood shown in Figure 28, and the service conditions, so far as could be ascertained, were no more severe.

The temperatures encountered in rotary clinker coolers are not high enough to cause fusion or slagging, and the refractory problem here resolves itself chiefly into one of choosing refractories of high abrasion resistance with as high spall resistance as can be incorporated in a hard abrasion-resisting refractory.

In recent years much attention has been given to the subject of quickly cooling clinker, and to start the cooling while the clinker is still at almost maximum temperature. This has been accompanied by the introduction of cooling equipment of different types, such as the "preheater type," "air-quenching type," "recuperator type," etc. Most of these, to accomplish their purpose, require that temperatures at the discharge end of the kiln, in the clinker chutes, and in the high-temperature zone of the equipment itself be higher than was formerly carried in these relative positions. This calls for a careful selection of refractories to withstand the conditions imposed upon it. However, the designers of such equipment know what is required of refractories and, with a wide range of refractories of varying characteristics to choose from, it can be said that this development has presented no serious refractories problem.

Operating Suggestions. — This discussion would not be complete if it failed to relate a few items, sometimes overlooked or considered unimportant, but which do have

Figure 32

their effect on the ultimate results a refractory will give in service.

It is always good policy to bring a refractory lining to operating temperature slowly and gradually. This is more important in connection with newly-laid linings and old linings that have stood idle long enough to have absorbed considerable moisture from the atmosphere than is the case with linings that have seen service and have been idle for but a relatively short time. A few extra hours added to the heating-up period usually adds many valuable hours in ultimate over-all lining life.

Many companies provide good storage facilities in which to store their bricks. This is highly desirable, for if bricks are stored where they can be rained on or in some other way be exposed to water absorption, they will absorb an important amount of water. What will happen to a watersoaked brick if not carefully dried out before subjecting it to high heat is obvious. It can act very much as a tightly-corked bottle of water placed on a hot stove, either the cork will "pop" or the bottle will burst. In the case of the brick there is no cork to pop. There are some plants where better storage of bricks—especially of bricks for extremely-high heat service—could profitably be undertaken. A patch in the roof, planks raised from the ground on which to place the next lot of high-heat service bricks received, may be all that is necessary. Good housekeeping in the brick shed has its good effect on bricklayers, and on the quality of their workmanship.

The good-housekeeping idea can also often be extended with good effect into the kiln itself. Rush repair jobs must, of course, be done in the shortest possible time, but frequently a procedure which in itself appears to be time-consuming can easily speed up tasks of installation to the end that a saving is effected in over-all installation time. It can also result in a better installation. There should be little occasion to throw and pile bricks at random into a kiln, as was done in the case illustrated in Figure 30. It is far better policy to try to preserve as much as possible the sharp corners and edges which the refractories manufacturers go to great trouble to give the bricks.

Kiln Diameter.—From the standpoint of room to work in a large-diameter kiln is easier to line than a small-diameter kiln. However, to take full advantage of this condition there are some aids that can easily be supplied to give assurance of speed and good workmanship in the installation. A few planks prop-

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erly placed, as shown in Figure 31, will help a great deal. Laying up bricks on the sides of a large kiln can be done quicker and better if done from a few planks properly placed than if attempted from an insecure footing as in the case of the workman shown in Figure 32. The planks are also very helpful when it comes time to "jack" the lining, as well as the fitting and driving of key bricks to close circles. Such planks could well be standard masonry department equipment and cared for and treated accordingly.

Fortunately not often, but occasionally nevertheless, linings are installed in kilns sorely in need of mechanical repair to such a degree that no refractory lining can do its best. There have been times when linings have been installed in kilns with so many loose rivets (many out altogether) at butt straps, or in tire zones, that when the kiln revolved the movement between adjacent shell plates could do no other than loosen the lining and contribute to much shorter lining life than if the rivets were all in place and tight. Linings have also been placed in kilns with very badly cracked shells at the front tire, with the result that there was bound to be kiln deflection as the kiln revolved. The effect on the lining is obvious. Linings have been laid on kiln shells with the shell burned out in spots. Such a shell is shown in Figure 33. This burned-out spot was about 24 inches long and 12 inches wide. It was at the front tire and right in the burning zone. The edges of the inner plate stood 1 inch to almost 2 inches from the stiffening plate it rested on. The cavity was filled with high-temperature cement, but even so the lining was at a disadvantage. Linings have also been laid over shells that, without exaggeration, resembled more the extended bellows of an accordion than a rotary-kiln shell. In all such installations the linings are at a decided disadvantage from the start. Extensive kiln repairs can not be conveniently made in the midst of a run, but it is surprising how often one encounters kiln conditions, as just described, when a lining is being installed in a kiln that has been idle for weeks and months.

Figure 33

It is the business of refractory manufacturers to make and sell their product, yet there is no greater satisfaction a refractory manufacturer can get, nor anything that pleases him more, than to know his product is rendering satisfactory economical service in a user's operation. He is just as anxious to see users break records as is the user himself. This being so, it is felt the following comment will not be misconstrued. Very often, because pressed for production or a desire to economize as much as possible, possibly both, when a repair must be made during the course of a run there is a temptation to replace too small a section of lining and leave some lining in the kiln that doubtfully has the appearance of being able to render further service. Very often the temptation is great enough to overbalance the doubt that exists, with the result that the section of doubtful value is returned to service. Occasionally it may work surprisingly well, but usually it does not and the kiln must be shut down again in a short time for a repair that should have been made when the kiln was down before. Not only has it occasioned an extra shutdown, which in itself is bad enough, but it also contributes to shorter life of the rest of the lining than if the extra shutdown had never occurred.

Some years ago badly flared and burned-out coal-burner pipes were a very common cause of shortening lining life in the burning zone. Paradoxical as it may seem, the trend toward higher temperatures at the discharge end of kilns has reduced materially the damage to linings from this cause. The higher temperatures caused burner pipes to flare and burn out to such an extent that some way had to be found to better burner-pipe service. This betterment has come about in several ways, including water-cooling, heat-resisting metal, and in some cases by making the burner pipe of the thinnest practical thickness to benefit by the cooling effect of the primary air fed through the burner pipe with the coal. However, the coal-burner-pipe problem still exists in some plants where it is not unusual to encounter burner pipes that look as bad as, or worse than, the one illustrated in Figure 34.

Occasionally one finds kilns with heavy accumulation of dust "caked" on the outer shell. It may be of interest to mention that in at least one plant it was found that the burning-zone lining life was sufficiently greater when the kilns operated without this layer of dust to make it standard practice to "sweep the kilns with stiff wire brooms at fixed intervals. This is understandable when one considers the mechanics of building up and maintaining a protective clinker coating on the lining in the burning zone.

It has been mentioned that kilns are actually sensitive furnaces. This has been proved true many times. A good example is that of a plant that experienced much burning-zone lining trouble and where almost everything conceivable was checked and done in an effort to get better lining life. Short life continued until one day, quite by chance, the plant superintendent noticed that each burner used his own glasses, with the burner on one shift using dark blue glasses, the burner on the second shift using blue glasses not as dark, and the third burner using ordinary "smoked" glasses. Blue glasses of the same color were furnished all burners and lining life improved at once.

The latter experience can properly fall under the head of human element, which was earlier referred to as an extremely important one in the list of conditions that can, and do, have their effect on kiln-lining life. One of the best examples of

Figure 34

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how important the human element can be is the experience at a plant where it was common practice for all in the kiln room to retire to the machine shop at about midnight where they gathered around a fire to brew and drink some hot coffee. This consumed considerable time during which the kilns ran themselves. This plant experienced much lining trouble and the change from fire-clay brick linings to high-alumina-brick linings, and later to unburned-magnesite brick linings, helped but little. When the plant manager learned of the nightly coffee parties, they were, of course, discontinued and the kilns no longer go through periods of running themselves and they are again giving satisfactory lining life on fire-clay brick linings, believe it or not.

Great forward strides have been made in recent years with instrument and automatic control equipment to remove some of the uncertainties that faced the Portland-cement manufacturer of former days. The more uniform combustion control, feed control, and kiln operation in general, made possible by the use of such equipment, should show in improved refractories service. Furthermore, the refractories industry realizes fully its responsibilities not only to maintain quality in its products, but also to seek constantly to improve them. All this, together with the continued close co-operation that has long existed between the Portland-cement and refractories industries, augurs well for further forward progress in the future.

Post-war Prices Periled By Rising Labor Costs

The tremendous rise in output per man-hour and a sharp decline in unit labor costs in recent years in war industries have not been paralleled in the cement and other civilian industries. In the latter there were no significant gains. Some declines in productivity were noted, while unit labor costs rose, according to a study of "Trends in Unit Labor Costs," appearing (March 12) in the *Conference Board Business Record* of the National Industrial Conference Board.

These trends were viewed by the authors of the study as a serious, but little-discussed, threat to the post-war price structure. Wage costs per unit of product for all manufacturing have mounted steadily since 1941, and in 1944 they stood 39 per cent. higher than in 1939. The cost of raw materials used by manufacturers rose 60 per cent. in the same period. Meanwhile, as price controls were steadily broadened, prices of finished manufactured goods were stabilized and in 1944 were only 25.4 per cent. higher than in 1939.

Between 1939 and 1943, manufacturing payrolls more than tripled and production rose about two and a half times. The number of man-hours worked fell a little short of doubling. Preliminary estimates for 1944 indicate that payrolls continued to increase, although production and man-hours declined.

Productivity gains were greater than the rise in payrolls in industries producing war materials, so that unit labor costs were reduced, according to the study. It was found, for example, that the cost of a light bomber was reduced from $11 a pound of airframe to $5.10 between January, 1941, and January, 1944.

Disclosing a far different situation in civilian industry, the study authors found that in all the 25 civilian industries for which data are available, unit labor costs were higher in 1943 than in 1939.

Unit labor costs rose from 30 to 40 per cent. in ten industries and subgroups, including cement, boots and shoes, slaughtering and meat packing, and lumber and timber products. Rises of 40 to 50 per cent. were found in the fertilizer industry, in cotton goods, woolen and worsted goods, primary smelters and refineries of nonferrous metals, paper and pulp, chewing and smoking tobacco and snuff, and canned and cured fish. In the manufacture of flour and other grain products, labor costs per unit increased 60 per cent. in the four war years.

With the prices of finished goods virtually stable, and with labor costs per unit and raw materials prices advancing sharply, the study warned that a serious threat to the post-war price structure was being ignored in current discussion. Said the authors:

"Deterioration in the relationship of wage costs to prices in manufacturing has high inflationary potentials. . . . Public attention has been largely directed to the demand aspects of the inflationary situation, emphasizing primarily the excess of purchasing power in the hands of consumers as compared with a stable or dwindling volume of consumer goods. Relatively little attention has been directed to the influence of higher costs of production, including higher basic wage costs, upon the post-war price structure."

Ickes Outlines Mineral Output of U. S., Alaska

Secretary of the Interior Harold L. Ickes announced that the United States and Alaska produced a record total of $8,543,000,000 in minerals in 1944, shattering the previous high of $8,056,000,000 established in 1943.

Quoting information provided by the Economics and Statistics Branch of the Bureau of Mines, Secretary Ickes said the 1944 output represents a gain of 6 per cent. over 1943, the first year that the "Arsenal of Democracy" passed the 8-billion-dollar mark. In 1942, another record year, output was $7,575,700,000.

The 1944 peak was 54 per cent. higher than the World War I total of $5,540,708,000, established in 1918, and represents the all-out efforts of the mineral industry to meet the exceedingly heavy demands of the armed forces for war equipment and materials.

Of the estimated total of $8,543,000,000 in mineral output, mineral fuels contributed $5,254,000,000, compared with $4,589,000,000 in 1943, an increase of more than 14 per cent.; metallic products reached $2,377,000,000, compared with $2,493,000,000 in 1943, a drop of nearly 5 percent.; and nonmetallic minerals, other than fuels, $912,000,000, compared with $974,000,000 in 1943, a decline of about 6 per cent. Major factors contributing to the decline in metallic products and nonmetallics, other than fuels, were the reduced demand for certain metals, man-power shortages in many mineral-producing areas, and the continued slump in the building industry. All the fuels registered gains.

Of the other nonmetallic minerals, asbestos, native asphalt, barite, boron minerals, emery, feldspar, fluorspar, lithium minerals, mica, mineral pigments, phosphate, potash, pyrites, salt, sodium salts, sulphur, and talc showed moderate to large increases. Decreases were shown by most abrasives, cement, clay products, graphite, kyanite, peat, sand and gravel, slate, and stone.

According to an announcement from the Foreign Economic Administration, Madagascar graphite, reserved since 1943 for purchase only by Allied governments, now is available for private trade. Importation will be subject to the War Production Board's order M-63.

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Agstone Production Increasing But Survey Shows Big Unfilled Demand

● Reports on the use of agricultural lime and limestone by states are contained in the following letters received in answer to inquiries directed to all Agricultural Adjustment Agencies recently. Explanations of deficiencies in production, suggested remedies and advice on the location of new plants are included.—Directing Editor.

NORTHEAST

Connecticut THE use of liming materials reached an all-time high for 1944, the total amount used being estimated at 64,842 tons; 50,842 tons was supplied by contracts under the A.A.A. program and an estimated 14,000 tons was sold through regular trade channels. This is still below the amount that should be used annually to keep our soils in the most productive state according to our agronomist.

Production was about adequate to meet demands but many orders for early delivery were not made until late in the year. Farmers have been encouraged by A.A.A. committeemen to take their deliveries when the lime is available and not insist on spring delivery.

There are plans being made for expansion of production by some suppliers for 1945 and this will more than offset the production lost by closed plants. Necessary priorities have been granted by the W.P.B. to take care of repairs needed by suppliers to keep plants in operation.

The trucking problem is difficult, but all deliveries were made under the A.A.A. program before November 1, 1944. About 60 per cent of the A.A.A. orders were handled by railway, the farmers doing the trucking from the siding to the farm. This relieved the trucking situation to a great extent. No spreading service was available in 1944.

AGRICULTURAL ADJUSTMENT AGENCY,
ERNEST W. SKILTON,
Farmer-Fieldman.
Mar. 22, 1945.

Maine AGRICULTURAL limestone production in 1944 was roughly 90,000 tons, which completely supplied the demand.

New facilities are needed to bring about better distribution. A new plant is being established in Aroostook County. This new company, Industrial Enterprises, Inc., Presque Isle, has had considerable difficulty in obtaining priorities for its equipment.

There has been no serious complaint about the W.P.B. in the matter of priorities thus far. There has been some minor price relief.

AGRICULTURAL ADJUSTMENT AGENCY,
A. K. GARDNER, *Executive Assistant.*
Mar. 24, 1945.

Massachusetts THE amount of lime distributed by the A.A.A. was 66,095 tons; the amount of commercial distribution, 10,000 tons (estimated).

The demand is increasing; so is production.

Complete new production equipment was installed in the old Hoosac Valley quarry at Adams under authorization of the W.P.B.

So far, trucks have been available for delivery in near-by areas. The spreading service is confined to one farm.

AGRICULTURAL ADJUSTMENT AGENCY,
S. R. PARKER, *Administrative Officer.*
Apr. 11, 1945.

New Hampshire In 1944 the amount of liming material distributed under the A.A.A. program was 35,719.31 tons. We estimate that 1,000 tons was purchased outside the program.

I doubt if there was any considerable active demand that was not supplied, but there is real need for again as much lime as we are now using.

New plants and enlargement of present facilities will be necessary to take care of the increasing demand that will result from educating farmers in the need for increased use of lime.

AGRICULTURAL ADJUSTMENT AGENCY,
EARL P. ROBINSON,
State Executive Assistant.
Mar. 19, 1945.

New Jersey LAST year Dr. Firman E. Bear of our Soils Department here at the college estimated that 204,357 tons of lime was used in this state. This compares with 97,421 tons used in 1940.

Production facilities seem to be adequate to meet the greater part of our needs.

We have had a very severe winter and farm deliveries were behind schedule. We could use more trucks and men in this type of work but believe agriculture will not suffer greatly because of lack of lime.

AGRICULTURAL ADJUSTMENT AGENCY,
H. EARL PROPST, *Executive Assistant.*
Apr. 16, 1945.

New York UNDER the 1944 (November 1943 through October 1944) A.A.A. program farmers were furnished 674,000 tons of agricultural limestone and 1,000 tons of marl. No hydrated lime or burned lime was furnished under the program. Approximately 35,000 tons of hydrate lime was sold to farmers during this same period.

Excluding a few local situations, production has been adequate to meet the demand. Insufficient labor was the main reason why these conditions existed. We believe there is no need at the present time for enlargement of existing plants. The W.P.B. has done an excellent job in helping producers to get necessary machinery. There seem to be enough truckers available to make the necessary deliveries but there is a shortage of equipment and men for spreading. Spreading by commercial jobbers we believe is on the decline because of these reasons. The O.P.A. has coöperated to the fullest extent in bringing price relief to producers who have been operating under unprofitable price ceilings.

AGRICULTURAL ADJUSTMENT AGENCY,
W. L. WEBSTER, *Deputy Executive Assistant.*
Mar. 24, 1945.

Rhode Island IT is our estimate that 9,797 tons of ground limestone equivalent was used in 1944. Of this total, around 7,400 tons was obtained through the A.A.A. program. This may be compared with the approximate annual requirement of 19,000 and 20,000 tons for the state, if a good production job is to be done.

The unsupplied demand was probably due to the fact that many producers do not register their brands with the state under state law. Most producers were probably pushed to the limit of their ability to produce with a curtailed labor supply.

There is only one area in the state where the production of agricultural lime is possible and the plant situated in that area is not in operation.

The W.P.B. has been very sympathetic and has helped producers with the necessary priorities for production machinery.

The availability of truckers is apparently a definite problem here, for delivery of both limestone and fertilizer. Other than for any liming material produced within the state, at the one deposit referred to above, trucking is not practical as our next source of supply is western Connecticut and Massachusetts. Distance is a factor.

AGRICULTURAL ADJUSTMENT AGENCY,
T. S. SHAW, *Executive Assistant.*
Mar. 15, 1945.

EAST CENTRAL

Delaware FORTY-TWO THOUSAND tons of agricultural liming materials was used in 1944, and there was a demand for 10,000 tons that could not be supplied.

The shortage was due to the lack of labor at the plants. We suggest the use of German war prisoners.

There are no producing plants in Delaware, but plants supplying present needs would be adequate if labor were available.

The W.P.B. has helped producers get the machinery they needed.

We are short of truckers for delivery and spreading.

Producers have been able to operate at a profit.

DELAWARE STATE A.A.A. COMMITTEE,
C. E. OCHELTREE, *Chairman.*
Apr. 11, 1945.

Kentucky LAST year Kentucky associations ordered through our state office 750,000 tons of limestone of which 630,000 tons was delivered. In 1942 the relationship was 400,000 tons as conserva-

tion material to 800,000 commercial and in 1943 600,000 tons as conservation material to 600,000 commercial. Not as much commercial limestone was utilized in 1944 under the program as conservation material.

Technicians have estimated our annual demands as 10,000,000 tons. However, if sufficient sources could be developed with an aggregate production from 3 to 5 million tons most of the demands could be met satisfactorily. This year the offerings in response to our general advertisement exceeded 2 million tons, but as most offerers' expectations at the beginning of the year greatly exceeded performance the amounts available in 1945 probably will be considerably less.

Lack of labor, difficulties in obtaining equipment, supplies and replacements, inability to secure trucks, drivers, parts and rubber—all contribute to the general shrinkage of the quantities being distributed. Also large quantities of material have been available in the past as a by-product at low cost, and this has had a tendency to discourage the formation of new enterprises devoted solely to the production of agricultural limestone.

Going concerns are able after delays to obtain what repairs, replacements and even new equipment they require, and reasonable price increases are afforded through the O.P.A. Still, the many problems constantly confronting the industry these days, coupled with extraordinary risks and not especially large margins of profit, are taking their toll. Recently one of the large suppliers in the western part of the state notified us that his business was being voluntarily liquidated.

KENTUCKY STATE A.A.A. COMMITTEE,
M. D. ROYSE, *Chairman.*
Apr. 4, 1945.

Maryland THE State Inspection and Regulatory Service reports 228,498.21 tons of all types of lime sold during 1944; this includes limestone, lime, marl, refuse, etc. We estimate that this would represent approximately 300,000 tons of ground limestone equivalent (on the basis of 100 pounds of ground limestone equalling 50 pounds of burned lime, 70 pounds of hydrated lime and 150 pounds of refuse). Approximately 50,000 additional tons of ground limestone or its equivalent could have been used if the material had been available when the farmers desired it.

Labor shortages, inadequate trucking facilities, lack of box-cars, diversion of lime to high-priority industrial uses, and adverse weather conditions were primarily responsible for production not meeting the maximum demand. Many difficulties could have been avoided mainly if farmers had obtained the material at times other than the peak season months of March, April and October.

Some new plants could be put into operation in Garrett, Washington and Frederick Counties. Several plants in Washington County have gone out of business, primarily due to lack of labor; one of these plants closed up this year because of lack of labor and its inability to furnish sufficient data to justify an increase in price. There are several marl deposits in Washington County which could be worked; it would be necessary, of course, to obtain entirely new equipment. One large lime-producing company in Frederick County could operate another plant if it was able to obtain enough labor to operate it efficiently.

We have assisted several lime producers in obtaining necessary machinery and in every instance the W.P.B. has coöperated whole-heartedly and the equipment was received. There is no instance that we know of where the W.P.B. has failed to approve requests for necessary machinery for lime producers.

It appears that there is an adequate supply of trucks for the delivery and spreading of materials throughout the year, if a more equal amount of material is obtained by farmers during each month of the year. However, the number of trucks for delivering and spreading the amount of lime demanded by farmers during the peak months is, of course, inadequate to meet maximum demands during those peak months. More lime would be spread and more service would be given farmers, if more spreading equipment were available to individual farmers. Therefore, the problem is not so much the lack of commercial trucking facilities as the difficulty farmers have in obtaining trucking and spreading equipment and the problem of getting farmers to obtain the material during the off-peak seasons.

The O.P.A. has been very fair in granting price relief to producers, and all filings for increase in price by Maryland producers were justified and approved.

MARYLAND STATE A.C.C.,
JOS. H. BLANDFORD, *Chairman.*
Apr. 7, 1945.

North Carolina IN 1944 437,000 tons of agricultural limestone was used in the A.A.A. program, and approximately 30,000 tons of limestone and marl was purchased directly from dealers or manufacturers. Approximately 100,000 additional tons would have been used through the program had the material been available.

Lack of machinery, plant breakdowns, labor and car shortages are the reasons material can not be made available.

New production facilities are badly needed and if new plants could be installed in North Carolina, it would help the situation considerably.

Since we have only one plant in operation within the state and this is a new plant, it has not been necessary for W.P.B. to help producers get necessary machinery.

This year we have been able to contract for farmyard delivery of liming materials in every county, and any farmer can easily obtain material through the A.A.A. program. The contract does not call for spreading, which is the farmers' responsibility.

The O.P.A. permitted a supplier in an adjoining state to increase the price of its material when it was determined that it was operating under unprofitable price ceilings.

STATE A.A.A. COMMITTEE,
G. T. SCOTT, *Chairman.*
Mar. 22, 1945.

Pennsylvania WE estimate that 1,200,000 tons of liming materials was delivered to Pennsylvania farmers in 1944. The unsatisfied demand was probably not in excess of 100,000 tons. The inadequacy of the supply was almost entirely because of the shortage of labor.

Present production facilities in Pennsylvania are probably adequate; that is, if present plants could be operated to full capacity throughout the year, the total demand in the state could be supplied. To bring that about, of course, it would be necessary for lime to move in some instances as much as 150 miles. While this length of haulage is probably uneconomical in a state where limestone deposits are found over such a widespread area, it is doubtful whether facilities will be very much expanded at points which would result in a saving in transportation costs. While we believe production facilities to be adequate, we do not believe that the demand for liming materials in 1945 will be satisfied; in fact, we believe that the amount supplied in 1945 may well be considerably less than in 1944. The reasons are increased shortage of labor, and a greatly increased shortage of box cars.

Producers generally have been able to secure the necessary machinery, although frequently the delay in obtaining delivery has been costly.

The availability of truckers for delivery was a very difficult problem to handle last year, but producers were generally successful. This year the difficulty seems to be aggravated more by a shortage of drivers than of trucks.

We do not know of any instances in which producers have requested relief from unprofitable price ceilings.

AGRICULTURAL ADJUSTMENT AGENCY,
DONALD C. TYSON, *Administrative Assistant.*
Apr. 2, 1945.

Virginia WE estimate that between 1,000,000 and 1,200,000 tons of liming material was used during 1944. Of this tonnage the A.A.A. furnished 685,000 tons. We had actual orders for approximately 200,000 tons of material which could not be filled, so it is estimated that the demand exceeded the supply by approximately 500,000 tons. This demand could not be met largely because of the shortage of man power, which will be far more acute in 1945. To relieve this situation the production of limestone should be considered as an essential industry which would enable the manufacturers to hold their present labor.

There is an actual demand for at least 1,500,000 tons of ground limestone and at the present rate of production with existing facilities this demand can not be met. If adequate labor were available, present facilities could probably take care of the demand for 1945. There is a need for the annual use of approximately 2,500,000 tons of liming materials to not only maintain the proper soil reaction but to provide sufficient calcium in our soils for the proper nutrition of the livestock and people who must depend upon the soil for their food. It will require the expansion of existing facilities and probably new plants to meet this demand. With the exception of extensive marl deposits in the eastern part of the state, the only place for locating such plants would be in the limestone area which includes southwest Virginia and the Shenandoah Valley area.

Lime producers in this state have had very little difficulty in securing equipment.

The lack of adequate labor for unloading cars and the shortage of capable

truck drivers is probably more responsible for the inadequate delivery system than the lack of sufficient trucks. Before there can be any great expansion in the use of liming materials in this state, we will need additional trucks, labor and truck drivers.

The O.P.A. has been very coöperative in granting relief to producers who had been operating under unprofitable price ceilings. We do not believe the O.P.A. price ceilings have had very much, if any, effect in the failure to supply sufficient liming materials to farmers in this state.

VIRGINIA A.A.A. COMMITTEE,
R. B. BRIDGFORTH, *Chairman.*
Mar. 21, 1945.

West Virginia FARMERS who participated in the A.A.A. program, were delivered 517,210 tons of liming materials. Approximately 75,000 tons of orders was cancelled due to transportation difficulties and abnormal weather conditions during December. In addition, 12,424 tons of 20 per cent. superphosphate was furnished.

The production of these materials was not a vital problem. Adequate amounts of material were offered by approximately 39 producers, some of whom were located outside the state.

New production facilities are not particularly needed when the over-all supply problem is considered. However, the local development of limestone and marl veins, mostly in the counties in the eastern part of the state, would no doubt offer a more convenient source of supply to farmers in those counties. Development of more local sources would undoubtedly lighten the transportation problem.

The trucking problem was a real factor in getting material out to the farms. In some localities reliable truckers were not available for the operation of trucking equipment while in other localities the available equipment itself was not adequate to take care of delivery on all the orders placed. Many difficulties were encountered in obtaining gasoline, tires, and replacement parts.

STATE A.A.A. COMMITTEE,
J. WARD WOOD, *Chairman.*
Mar. 22, 1945.

NORTH CENTRAL

Illinois THE production of agricultural limestone in 1944 was somewhat greater than in 1943 and will come close to that of 1942, when approximately 3,800,000 tons was used. This represents an increase of almost 500,000 tons, but still is far short of the demand.

Illinois farmers should apply over 6,000,000 tons annually for the next 10 years, if they are to replace the calcium-carbonate equivalent depleted from the soil. A tabulation by our office in the summer of 1944, after the local A.A.A. Community Committee had contacted each farmer, showed that 6,400,000 tons of liming materials would have been applied had the material been available.

While there have been a few local areas hard pressed to find sufficient trucks to spread the material on the farms, we have no knowledge of any case where material was stock-piled at the plant because of a shortage of railway or truck transportation. Still, we doubt if the needs of all farmers can be supplied until after the war when better transportation should be available.

Most quarries are to be complimented on their efforts to increase their production. New machinery has been installed in many plants, but a shortage of labor has made it impossible for the operator to obtain maximum production. With the end of the war everyone expects a greatly expanded program of construction and road building, which will make available additional quantities of liming material as a co-product. This is extremely important in the over-all picture in Illinois, since a considerable portion is furnished by several large producers, who also make concrete aggregates.

Other government agencies, the W.P.B. and the O.P.A., have been coöperative in assisting producers to obtain new equipment and an adjustment in price where necessary to maintain profitable operations. There have been some difficulties, however, in obtaining sufficient equipment for new operators. Some of these may have to wait until there is a relaxation of restrictions to purchase new heavy equipment.

Effective in April, samples from all quarries operating in Illinois will be taken periodically by our local county committees, and submitted to an independent laboratory for mechanical and chemical analysis. Credit will be given under the Agricultural Conservation Program as determined on the basis of the analysis of the sample, and each farmer will be required to furnish dated scales tickets for material purchased commercially. If any material does not qualify with respect to fineness or calcium-carbonate equivalent, or both, a correspondingly greater amount of material will be required to earn credit under the program.

ILLINOIS A.A.A. COMMITTEE,
LEE M. GENTRY, *Chairman.*
Mar. 29, 1945.

Indiana IN 1944 849,561 tons of agricultural limestone and 58,241 cubic yards of marl was distributed by the A.A.A. Our demand which could not be supplied was 200,000 tons of limestone and 8,000 cubic yards of marl.

The lack of labor and the ceiling prices of labor in quarries and the lack of equipment were the major reasons for not being able to meet the demand.

Production facilities are lacking more in northeastern Indiana than in any other section. That is the Lake Region and marl is available but a good many farmers would prefer ground limestone if it could be had at a comparable price because of the difficulty of spreading marl.

The W.P.B. has helped producers in getting necessary repairs rather than the necessary machinery.

The lack of new tires and the overloading of trucks by limestone haulers which come under the critical eye of the O.D.T. has caused more truckers of limestone to cease hauling than any other one cause.

The O.P.A. has granted increases in price in numerous instances where they could be justified and met O.P.A. requirements.

INDIANA AGRICULTURAL CONSERVATION COMMITTEE,
L. M. VOGLER, *Chairman.*
Mar. 17, 1945.

Iowa DURING 1944 633,754 tons of limestone was furnished to farmers through the A.A.A. program. There was also distributed an estimated tonnage of 225,000 cash lime. It is also estimated that the demand for this material that could not be delivered might be from 300,000 to 400,000 tons.

There is quite a need for new production facilities and enlargement of some of the existing plants but this will have to wait until after the war is over.

The W.P.B. has been very helpful in getting replacements and some new machinery. The trucking of the material is limited because of some of those men entering the service and going to other war jobs.

The O.P.A. has been very coöperative in every case where evidence was submitted as to unprofitable prices.

IOWA AGRICULTURAL CONSERVATION COMMITTEE,
A. J. LOVELAND, *Chairman.*
Mar. 16, 1945.

Michigan APPROXIMATELY 252,000 tons of ground limestone was used on farms in 1944. Also, because Michigan has unlimited deposits of marl and a great many sources of refuse lime, farmers have used approximately 400,000 cubic yards of this material. The production of limestone was adequate to meet demands.

We are assured by various producers that it will be possible for them to increase their capacity to meet the requirements.

The W.P.B. has given producers the coöperation necessary to get machinery.

The availability of truckers for delivering and spreading material is just plain tough. A large percentage of the man power which in normal times would be available as drivers is in the armed services. Applications for the occupation of minor laborers to drive trucks (no manual labor involved) are not approved by the Labor Commission. In many cases, persons having contracts for distributing material are being taken into the armed service; therefore those contracts are terminated

Limestone producers have not asked the O.P.A. for relief on prices. They have continued to operate at a lesser profit.

MICHIGAN A.A.A. COMMITTEE,
MAURICE A. DOAN, *Chairman.*
Apr. 12, 1945.

Minnesota DURING 1944 contractors who had contracts with the A.A.A. produced and delivered to the farms 277,397 tons of ground limestone and 6,598 tons of agricultural marl. Commercial production is not very great. The Division of Soils, Department of Agriculture, University of Minnesota, estimates that Minnesota's annual limestone requirements amount to 871,542 tons. The demand by farmers, however, is not nearly as large as this.

Shortage of labor has been the main reason our contractors have not been able to supply the demand for limestone. Trucks and tires have also affected the expansion of existing production facilities to a certain extent. When adequate labor becomes available, new production facilities will be needed in the southeastern part of the state.

MINNESOTA AGRICULTURAL CONSERVATION COMMITTEE,
CHAS. W. STICKNEY, *Chairman.*
Mar. 23, 1945.

Missouri LIMING materials were used in 1944 to the approximate extent of 1,600,000 tons of which the major portion was agricultural ground limestone while approximately 5 per cent. used was lead-mine refuse material—a by-product of lead mines in eastern Missouri which runs very high in calcium-carbonate equivalent content. Farmer demand would have permitted the application of more than twice the amount of material actually used 'n 1944 had adequate production and distribution facilities been available. Our soil should have an annual application of approximately 4,500,000 tons of liming materials to replace annual losses through plant food use and erosion.

Production has been inadequate due to the lack of production equipment, experienced personnel and distribution equipment—trucks, tires, spreader beds, etc. To attain the desirable objective it would be necessary to have numerous additional production plants located in practically every county in the state and in a number of counties more than one plant operating in order to eliminate long hauls to the farm. Capacity of these plants should vary, of course, according to the location and the area to be served, but in general we would recommend capacities ranging from 100 to 500 tons a day. In almost all localities there are available ledges which contain material having adequate calcium content and which could be operated economically.

The W.P.B. has assisted limestone producers in securing necessary production equipment and with its coöperation and assistance the industry has been able to maintain production in 1944 at a level fairly comparable to previous years. The lack of sufficient distribution facilities is responsible for more of our problems than is the lack of production equipment. With present facilities production could be stepped up another 25 or 30 per cent if it were possible to distribute the material to the farms in the same volume.

The O.P.A. has done a very good job in granting price increases to producers where ceiling prices resulted in unprofitable operations. There has been very little complaint concerning the O.P.A. regulations and this is a result of a fair administration of ceiling regulations.

The limestone industry is in its infancy in our state and the field is open to efficient operators who are interested in establishing themselves in a lucrative business of a permanent nature. Farmers in Missouri realize the value of agricultural ground limestone when applied to their soil and as long as farmers are in a favorable purchasing position, there is no doubt that the demand for good material will continue to exist indefinitely provided that it is produced and distributed at fair prices.

Missouri Agricultural Conservation Committee,
C. W. Shepard, *Chairman.*
Mar. 21, 1945.

Ohio APPROXIMATELY 750,000 tons of liming materials was distributed under the A.A.A. program last year, and about 650,000 tons through other channels, in both cases somewhat less than in 1943 or 1942. The annual requirement is for 3,375,000 tons.

Production has been adequate to meet the demands; however, some regions have not received as much material as could have been used because trucking and railway facilities were not available.

The need for new plants or stock piles exists in the southwest central, east central and northeast sections.

The W.P.B. has been very coöperative in assisting producers in getting necessary equipment, and the O.P.A. has been generous in granting price relief when the producer has filed a just claim, and has presented the true facts.

Trucks and tire replacements are very limited.

The Ohio A.A.A. contracted for two types of material in 1945: agricultural meal and agricultural ground liming material.

Ohio Agricultural Conservation Committee,
Elmer F. Kruse, *Chairman.*
Mar. 22, 1945.

Wisconsin WISCONSIN farmers used approximately 1,933,000 tons of ground limestone during 1944. The limestone producers furnished this material during the year when the State Highway Department had one of the largest crushed-stone programs in its history.

More ground limestone was furnished to Wisconsin farmers through the A.A.A. program in 1944 than in any year since this program was started. The A.A.A. furnished 1,265,803 tons of ground limestone, 29,806 cubic yards of paper-mill refuse lime, and 14,717 cubic yards of marl.

The southern two-thirds of Wisconsin has good sources of limestone available in every county, but there are no limestone deposits in the northern counties. Since we have several plants with large capacity well situated to ship material into the northern counties the demand for material has been satisfied in this area.

In the southern area many counties have not been able to obtain a supply of ground limestone due to the shortage of readily portable plants with large capacity. At present there is a demand for operators who could set up in several local quarries each year. Approximately 200,000 tons of orders would be available for new operators of this type.

Producers have encountered some difficulty due to the shortage of trucks, but they have continued to make deliveries by repairing old trucks and purchasing the few new trucks which were available. An effort has been made to save tires and equipment by eliminating long truck hauls. If the material must be transported long distances it is shipped by railway and then trucked to the farm, rather than hauled the entire distance by truck.

Agencies such as the W.P.B., O.D.T. and O.P.A. have recognized the essentiality of the limestone industry and given all possible assistance to the contractors so that it has been possible for them to obtain repairs and some new equipment and also receive a reasonable price for their product.

Wisconsin Agricultural Conservation Committee,
Axel Sorensen, *Acting Chairman.*
Mar. 29, 1945.

SOUTHERN

Alabama UNDER the 1944 program we furnished the following: Limestone, 160,115 tons; calcium silicate, 79,469 tons; total, 239,584 tons.

Production in this state is adequate to meet demands but present plants are located within a small area while there are deposits of acceptable material located in every section of the state and it could be delivered with a maximum haul of 75 miles.

The need is for small plants distributed throughout the state. In southeast Alabama, where the demand is greatest, there are numerous deposits of soft agricultural limestone where plants could be located for farmyard delivery and this would give economical distribution.

Operators did not experience any difficulty during 1944 program year in obtaining from the W.P.B. such assistance as was necessary to secure repair parts.

The availability of truckers for delivering and spreading is very limited. The shortage of trucks accounted for our not delivering a greater quantity of materials during the past year, and the situation will be even more critical during 1945.

The only quotations received for the 1945 program year involving increases in price were within the O.P.A. ceiling price and we have not experienced any difficulty.

Agricultural Adjustment Agency,
T. H. Martin, *Acting Administrative Officer in Charge.*
Mar. 28, 1945.

Arkansas DURING the calendar year 1944 the A.A.A. distributed to farmers 73,526 tons of agricultural limestone. About 8,000 tons was bought for cash by farmers. Had production and delivery facilities been adequate, around 130,000 tons would have been furnished.

By contrast, 14,763 tons was used in 1938, the first year agricultural limestone was offered to farmers as a conservation material under the A.A.A. program. Each year since 1938 the demand has been in excess of the available supply.

In 1945 it is anticipated that production facilities will be adequate to supply the demand since there has been a considerable expansion in the plants already operating, and one new plant for production of agricultural limestone has been established at Jones Mill. The indicated production facilities for 1945 will probably have a capacity of 300,000 tons.

Any difficulties encountered in connection with the 1945 program will be with regard to delivery facilities rather than production capacity; however, the indications are that adequate delivery facilities can be worked out to make limestone available on a farmyard delivery basis to most of the counties.

If no unusual production and delivery difficulties are encountered in 1945, farmers will probably use about 150,000 tons of material through the A.A.A. program.

The demand for material which will be bought by farmers for cash will be increased considerably over previous years.

Agricultural Adjustment Agency,
J. L. Wright, *Administrative Officer in Charge.*
Mar. 24, 1945.

Florida ACCORDING to the State Department of Agriculture records 75,894 tons of liming material was used in 1944. From this amount approximately 45,000 to 50,000 tons was ap-

plied directly to farm lands as limestone. The remainder was used as a conditioner in mixed fertilizers and related agricultural uses.

Production apparently has been able to supply the demand. However, the demand would be greater if producing plants were located at several points in areas of the state where no plants are now located. With one or two exceptions all the present producing plants are located in the central portion of the state. A few additional plants, with moderate capacity, are needed on the east coast and in north and west Florida.

It is almost impossible to secure truckers for delivering and spreading. Farm operators in most cases have to depend upon their own facilities. The tonnage used in any particular locality near a railhead is not sufficient to attract large fleet owners, and small truck operators can make more money hauling fruits and vegetables.

Apparently Florida operators have not been operating under unprofitable ceilings.

AGRICULTURAL ADJUSTMENT AGENCY,
H. G. CLAYTON, *Administrative Officer in Charge.*
Mar. 31, 1945.

Georgia APPROXIMATELY 100,000 tons of limestone was furnished through the A.A.A. under the 1944 program. Approximately 15 to 25 per cent. of the above figure would be a conservative estimate of the amount secured through other channels. The figures given above are approximately 25 per cent. less than the actual demand.

The principal reason for the supply being inadequate was the lack of production and delivery facilities. Due to war-time restrictions, neither farmers nor limestone dealers have been able to secure adequate hauling equipment and since the bulk of the material is requested on a farmyard delivery basis, the facilities for meeting the demand were inadequate.

There are in Georgia a number of potential limestone supplies in the form of only idle deposits, which appear to be strategically located and would to a large extent, if developed, solve the limestone delivery problem since they are closer to the requesting territory. Present production facilities need little enlargement since their immediate territory is probably being adequately served.

The W.P.B. has, as a general rule, been rather liberal in granting priorities for machinery for both repair and enlargement of existing facilities. We have had no experience as to its attitude toward the initiation of new facilities.

The O.P.A. has generally been reasonable with reference to increases in ceiling prices and it is believed that the ceilings now established are fair and do allow limestone producers a reasonable profit. We have had only one case in which a special appeal was made for increases in prices which request was granted in such a manner as to be satisfactory to the producers. The general increase in ceiling price levels has taken care of producers in a satisfactory manner.

AGRICULTURAL ADJUSTMENT AGENCY,
T. R. BREEDLOVE, *Administrative Officer.*
April 16, 1945.

Louisiana ESTIMATED limestone distribution last year was 275,000 tons, 258,000 (actual) by the A.A.A. Could have used another 50,000 if it could have been supplied when wanted.

The demand was above normal, due to more than usual encouragement by the A.A.A. last year. However, there appears to be a potential demand or a need for 1,000,000 tons per year.

If farmers can be made to realize the need and value of lime, more facilities will be needed along the coast. There are no deposits of high-percentage $CaCO_3$ material in the interior; plenty sea shells on the coast.

There were plenty of truckers in most parishes (counties) during the latter half of last year. Worn-out trucks and other demands for hauling make fewer trucks available this year.

No complaint has been registered against the O.P.A. by local lime producers.

AGRICULTURAL ADJUSTMENT AGENCY,
L. A. MULLIN, *Administrative Officer in Charge.*
Mar. 20, 1945.

Mississippi LAST year we obtained delivery on approximately 825,000 tons of liming material. The probable demand last year would have approached 2,000,000 tons, had adequate supplies been available.

Our local sources have not developed as rapidly as we had hoped, due to the unusual type of deposits which we have and to the lack of interest on the part of prospective producers, due somewhat to the shortage of adequate machinery, equipment and labor.

Thinking of long-time needs, we see that there is a need for the rapid development of sources nearer to us so as to eliminate high freight costs.

The W.P.B. and the O.P.A. have been very coöperative in helping the situation.

AGRICULTURAL ADJUSTMENT AGENCY,
T. M. PATTERSON, *Administrative Officer in Charge.*
Mar. 19, 1945.

South Carolina UNDER the 1944 program 517,000 tons of limestone was delivered to the farms, compared with the maximum amount of 130,000 tons handled under the best previous year. Actual orders for limestone amounting to over 1,000,000 tons were received from farmers. The full demand could not be met due to inadequate production and sources of supply and inadequate transportation facilities.

During 1944 a new source of limestone was developed at Holly Hill. The N. K. Dickerson Company of Monroe, North Carolina, and the Superior Stone Company of Raleigh, North Carolina, leased a large acreage of marl limestone deposit and installed a large-capacity drying and grinding plant. This installation did not get into active operation until late in August. Approximately 90,000 tons of limestone was delivered from this plant before the close of the year.

Under the 1945 program the outlook is for less tonnage than in 1944 due to the fact that the A.A.A. payments to farmers for the use of limestone in 1945 have been reduced and the farmers have to pay personally at least 20 per cent of the cost of the limestone delivered to the farm. It is expected that the material obtained this year will come from Holly Hill and Gaffney, South Carolina, and Mascot, Tennessee.

The W.P.B. coöperated with the persons interested in the installation of the plant at Holly Hill, and the necessary priorities were granted.

Although the supply of trucks and, particularly, truck tires has become a greater problem, the present indications are that a sufficient number of both will be available for the hauling of limestone to the farms in 1945.

AGRICULTURAL ADJUSTMENT AGENCY,
R. W. HAMILTON, *Administrative Officer.*
Mar. 24, 1945.

Texas TEN THOUSAND tons of agricultural limestone was furnished by the A.A.A. under the 1944 conservation program. Our source of supply is capable of furnishing approximately 100,000 tons of agricultural limestone each year, therefore, we did not encounter any difficulty in obtaining the material. It is believed that production will be adequate to meet our demands for at least the next few years.

No difficulty has been experienced in obtaining necessary machinery through the W.P.B. since our source of supply is well equipped to furnish our needs without additional machinery.

We have not yet experienced any difficulty in obtaining truckers to deliver and spread agricultural limestone, however, the use of this material is rapidly expanding and in all probability some difficulty will arise in the future.

It is anticipated that a great increase in the use of agricultural limestone in Texas will result in the next few years.

AGRICULTURAL ADJUSTMENT AGENCY,
B. F. VANCE, *Administrative Officer in Charge.*
Apr. 9, 1945.

WESTERN

California WE do not have available the agricultural-lime consumption figures for 1944. However, the use of such material is of minor importance. There has been no difficulty in obtaining lime to take care of what requirements we have.

AGRICULTURAL ADJUSTMENT AGENCY,
DAVE DAVIDSON, *Chairman.*
Mar. 19, 1945.

Colorado COLORADO soils do not indicate a lime deficiency. In the past year there has been an increase in the interest shown in the use of agricultural limestone; however the use is still very limited. The practice of applying agricultural limestone is not included in our Conservation Program.

COLORADO STATE COMMITTEE,
LEWIS T. SHARP, *Acting Chairman.*
Mar. 20, 1945.

Idaho Agricultural limestone is used to only a very limited extent in this state. In some small local areas farmers have experimented with limestone and the results obtained were negative. Those persons who are still experimenting with this material are able to obtain a sufficient amount to satisfy their needs.

AGRICULTURAL ADJUSTMENT AGENCY,
STATE COMMITTEE,
L. F. RENSTROM, *Acting for Chairman.*
Mar. 22, 1945.

Kansas We estimate the total amount of agricultural lime used by farmers in 1944 to be 530,000 tons and this is approximately 50 per cent. of the orders placed. Kansas got started late in the use of agricultural lime and until 1944 the state had a very limited number of producers of agricultural lime. In 1944 we gave special emphasis to the use of agricultural lime and were able to secure many new plants.

The 1945 outlook is very good since we now have 29 producing plants well located and this number may be increased to 34 or 35 by midsummer. Less than one-half of the acreage is considered to be located in the lime-requirement area and very few additional plants will be needed to supply the estimated annual requirements. Trucks, tires, and labor are serious problems but we anticipate that the total amount of lime spread in 1945 will be 750,000 tons.

We have had good coöperation from the W.P.B., the O.P.A. and the O.D.T.

AGRICULTURAL ADJUSTMENT AGENCY,
STATE COMMITTEE,
LAWRENCE NORTON, *Chairman.*
Mar. 17, 1945.

Montana For the first time this year we have included a practice for the application of lime in Flathead, Lake, Lincoln, Mineral, Missoula, Ravalli, and Sanders Counties. We do not know what the needs are for the application of lime in those counties; however, since we received recommendations that it be included, we have included it as a conservation practice this year. According to horticulturists, the need for the application of lime in Montana is negligible.

AGRICULTURAL ADJUSTMENT AGENCY,
MONTANA STATE COMMITTEE,
R. J. MCKENNA, *Chairman.*
Mar. 21, 1945.

New Mexico We do not use limestone, lime or marl in this state. The only payments made to farmers are for the use of superphosphate and gypsum. We are having some trouble in getting dealers to handle the phosphate as the O.P.A. ceiling price is so near the actual cost of the phosphate. We have not been able to obtain sufficient quantities in this state to meet the demands.

AGRICULTURAL ADJUSTMENT AGENCY,
STATE COMMITTEE,
C. V. HEMPHILL, *Chairman.*
Mar. 20, 1945.

Oregon It is estimated that 25,000 tons of agricultural limestone was used in 1944, which is perhaps half of the demand.

Lack of plant capacity, man-power shortages and transportation difficulties are the principal factors responsible for the inadequate supply.

It has been estimated that there is a need annually for at least 400,000 tons of agricultural limestone or about three times the present capacity of producers in Oregon. New plants should, of course, be located as near as possible to the consuming area, which includes practically all the farming region west of the Cascade Mountains including Hood River County and with the exception of most of Josephine and Jackson Counties. The main reason that limestone sources in California and in Washington have not been available to Oregon farmers is the high transportation cost. However, this year the A.A.A. has a contract with the Spokane Portland Cement Company for delivery of approximately 100 tons of bagged ground limestone monthly from the plant at Dolomite, Washington. Most of the production from this plant is being distributed in the state of Washington.

The W.P.B. has been coöperative. One plant (Oregon Portland Cement Company at Oswego) has recently expanded its production facilities and another plant (Sullivan Lime Company at Rogue River) was put into operation last year and is producing heavily this year. Both have contracts with the A.A.A. for furnishing limestone as conservation materials and expect to provide us with an aggregate of 7,100 tons per month.

While there has been a shortage of help, the shortages of trucks has been more of a problem. If there were more trucks available for spreading the distribution of limestone would be greatly facilitated.

Price increases have been granted to contractors furnishing limestone to the A.A.A. as conservation material in at least two instances in the last two years. The ceilings are high enough so that the plants are being operated profitably.

AGRICULTURAL ADJUSTMENT AGENCY,
N. C. DONALDSON, *Executive Assistant.*
Apr. 4, 1945

Washington The estimated amount of agricultural limestone, lime, oystershell flour, and marl applied by farmers in 1944 is 14,500 tons. This amount does not include sugar-beet pulp. Of the amount applied by farmers, an estimated 9,000 tons of limestone and oyster-shell flour was supplied under the A.A.A. program.

The tonnage for which there has been a demand and which could not be supplied is about 3,000 tons.

Production is not adequate to meet the demand because of many factors. One is the man-power situation which is extremely tight in the Pacific Northwest. Delivery facilities are another contributing factor as there has been a shortage of trucks for hauling the material. Also, some of the production has not been available to farmers but is being used to fill war-created demands.

There are needs for new production facilities in some parts of the state. In Pacific County there is an excellent deposit of limestone which has not been developed and which probably will not be developed until more capital is available for the erection of quarry facilities. In northeastern Washington there are some deposits on which quarry developments have been started but because of the labor situation they have been discontinued for the duration. Until the demand by farmers increases, the need for new facilities is not as great as might appear. Existing facilities, if plants could operate at capacity and deliveries could be made, should produce sufficient amounts to fill present demands. On the other hand, the demand for limestone is increasing and the need in certain areas is very great, and, as the demand increases, new production facilities will then be needed. Where limestone producers have needed additional machinery, the W.P.B. has helped them secure it.

We know of no petition to the O.P.A. for price ceiling releases.

The trucking situation is not good and we can expect that it will continue to be one of the bottlenecks until more trucks are available.

AGRICULTURAL ADJUSTMENT AGENCY
STATE COMMITTEE, C. P. DOWNEN,
Chairman, Pullman, Washington
Mar. 22, 1945

Lincoln Arc Welding Textbook Award Program

A 12-page brochure, covering the object and purpose of the award program for text books in modern design and setting forth all rules and conditions governing the program has been published by the trustees of the James F. Lincoln Arc Welding Foundation, Cleveland, Ohio. The foundation was organized to encourage the preparation of textbooks on design for the use of engineering undergraduates in machine design and in structural design for fabrication by all processes, including welding.

The brochure thoroughly covers the types of subject matter to be treated in the two fields, listing the awards, which total $20,000. It also deals with royalties for manuscripts of award-winning authors. The publication may be obtained by communicating with the secretary of the James F. Lincoln Arc Welding Foundation, Cleveland 1, Ohio.

You and the Returning "Vet"

Industry's effort to meet a critical situation in an adequate manner is exemplified in Allis-Chalmers Manufacturing Company's new booklet for foremen, *You and the Returning Veteran.* Prepared by company employees and the Wisconsin Society for Mental Hygiene, the manual is a valuable contribution to the national rehabilitation program for returning veterans.

The handbook describes the firm's reinstatement plan and gives the supervisory staff some practical pointers for dealing with ex-servicemen and their varied problems. Typical anecdotes describing the experiences of returning veterans are included to aid the foreman in giving intelligent and sympathetic direction to the men.

Allis-Chalmers already has employed more than 1,100 World War II veterans.

Arizona Nonmetallics, a new publication issued by the Arizona Bureau of Mines, gives a summary of past production and present operations in this field. The publication was prepared by Eldred R. Wilson and is number 152 in the Bureau's mineral technological series.

Kentucky Plant Increases Capacity Four Times In Ten-Year Period

another ON THE SPOT report

ALTHOUGH a considerable number of crushed-stone producers have materially increased their capital investment in order to produce and market larger quantities of agricultural limestone, the Hopkinsville Stone Company of Hopkinsville, Kentucky, is one of the few sizable plants in the country which have installed sufficient pulverizing capacity to handle their entire production. When the company built its plant in 1931[1] there was almost no demand for agricultural limestone, and the plant's production of 100 tons per hour consisted almost entirely of the nine sizes of aggregates listed in the state highway specifications. Since then Christian County, in which the plant is located, has become the second largest consumer of agricultural limestone in the United States.

This comparatively rapid acceleration in demand is closely paralleled by the steady increase in the company's sales of agstone. In 1935 approximately 4,500 tons of agricultural limestone was sold, but the following year the company installed its first pulverizer, a Jeffrey Type A-Z, 36- by 30-inch swing-hammer mill and, under the impetus of the A.A.A. program, sales leaped to 24,500 tons. By 1938 production was again lagging considerably behind the demand and a second pulverizer of the same make, 36 by 36 inches, was installed, with the result that sales in that year exceeded 54,000 tons.

The following year a Symons 3-foot short-head cone crusher was installed to provide a finer feed for the pulverizers, and the management felt with some justification that it had made adequate provision for any likely future production that might be required.[2] The approximately 45-t.p.h. capacity of the plant's two pulverizers made possible the marketing of more than 96,000 tons of agricultural limestone in 1941, but the demand was still far in excess of productive capacity. In 1942, '43 and '44 production fell somewhat below the 1941 peak due to a combination of factors, including the necessity of supplying large quantities of crushed stone for the construction of a near-by army camp, but the A.A.A. and the farmers continued their pleas for more agstone.

One of the two original hammer mills with its electric vibrating feeder.

The attractive office of the Hopkinsville Stone Company.

In March of this year the company took the ultimate step toward satisfying these demands by installing a new Jeffrey Type B-3, 42- by 48-inch pulverizer which has a rated capacity of 40 t.p.h. using ⅛-inch bars, but which will very probably produce in the neighborhood of 60 t.p.h. with 3/16-inch bars. With the normal by-product agricultural limestone produced in the primary and secondary crushing operations, the total capacity of the three pulverizers should approximate 100 t.p.h., enough to handle all the stone that can be put through the plant. Yet, despite this final all-out leap into agstone production, the company sees no prospect at all of being able to meet the demand this year.

About 65 per cent. of the company's agricultural-limestone production is sold through the A.A.A., and all sales are made on an f.o.b. plant basis. The $CaCO_3$ content of the stone averages about 92 per cent., and 90 per cent. of the pulverized product passes a 10-mesh sieve, both figures being well in excess of the specification requirements.

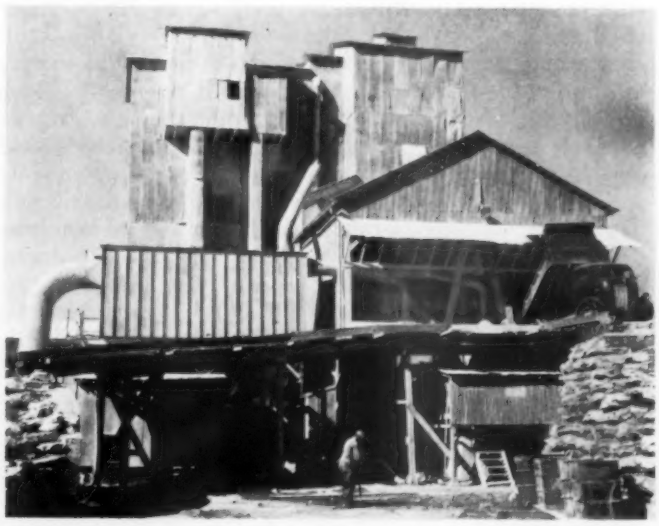
Both the original pulverizers have Jeffrey-Traylor vibrating feeders and the new installation will be similarly equipped. At the time the accompanying photographs were taken the

(*Continued on page* 93)

[1][A complete description of the original plant was published in the June 15, 1932, issue of PIT AND QUARRY—ED.]

[2][These latest improvements were described in an article in the April, 1941, issue of PIT AND QUARRY.—ED.]

Two plant views showing dust collector and ramp.



Doubling Lime Kiln Output and Production Efficiency

By THERON C. TAYLER

another P AND Q exclusive

IN NO industry other than lime and cement are changes so badly needed to increase output, improve quality and reduce the cost of manufacture. No other industries offer greater opportunity or equal challenge to engineers and scientists. Post-war activities will involve the

Theron C. Tayler

reconstruction of many existing plants, the building of new and more efficient units and the abandonment of many that are hopelessly inadequate.

Shaft-kiln lime-plant improvements will follow a definite pattern. Rotary-kiln plants will follow a widely-confused pattern out of which will evolve some more monstrosities and, it is hoped, some examples of what can be accomplished by good engineering. This article aims to create an interest in the use of engineering and science as the most direct path to better results.

Much rotary-lime-plant engineering has been a mere copy of or confusion with cement-plant design. There are certain parallels to be drawn between lime and cement plants but there are also some basic differences. Much confused thinking has ignored the differences.

It is said that a doctor buries his mistakes but an engineer builds a monument to his. Let us recognize that there is a difference between pencil pushing and engineering. The furnishing of plans and specifications, the copying of existing plants, does not constitute engineering even though it is being extensively paraded as such.

Thermal Efficiency The average 8-foot rotary lime kiln is producing about 80 tons of lime per day while consuming more than 27 tons of coal, a ratio of less than 3 to 1. This corresponds to a thermal efficiency of less than 30 per cent. Good engineering should get from that same kiln 160 tons per day while consuming the same 27 tons of coal, a ratio of 6 to 1, a thermal efficiency of 60 per cent. Increased output and increased efficiency are an inseparable combination; it is not possible to get one without the other.

If it is possible to get such results, it is a fair question to ask why rotary plants continue to be so inefficient. I can think of no better answer than to refer to a book entitled *Chemical Engineering and Thermodynamics Applied to the Cement Rotary Kiln*, written by Geoffrey Martin, published in England, and summing up his experiences with the British Portland Cement Research Association. In it he decries the lamentable lack of interest even though the industry was operating with an average thermal efficiency of only 19 per cent.

A few engineers have been saying much about the uses for high- and low-level heats. An appreciation of the importance of this subject is the first requisite to any attempt to improve kiln capacities and efficiencies.

Misuse of Heat High-level heat for a high-calcium kiln is that heat available above calcination temperature, about 1,650 degrees F. It is interesting to note that the amount of low-level heat available is exactly balanced by the requirements for such. The low-level heat available from the products of combustion (stack gases below 1,650 degrees F.) is exactly that required to preheat fuel and combustion air to 1,650 degrees. The heat available in the quicklime leaving the calcining zone at 1,650 degrees plus that in the liberated CO_2 is exactly that required to preheat the stone to 1,650 degrees. If we were to recover all such low-level heat by such exchanges as above outlined, and use all the high-level heat for calcination, we would get 10 pounds of lime for each pound of fuel of 13,780-B.t.u. heat value.

Instead, we waste 70 per cent. of such high-level heat by using it for purposes for which low-level heat is suitable. This wasted heat goes, in order of importance, to preheating the combustion air, internal radiation toward the kiln ends, loss through the kiln walls, to superheated lime discharge, to preheating the stone, to preheating the fuel, and to moisture in the fuel. If the high-level heat which we use for preheating air were used for calcining stone, this one item would more than double the kiln output.

Except for the heat in the liberated CO_2, it is confusing that the available low-level heats are at the wrong ends of the kiln for ideal balanced usage as above outlined. Thus, we find it necessary to use for preheating the combustion air and fuel the low-level heat from the calcined lime. When we have the low-level heat from only 3 pounds of lime at 1,650 degrees with which to preheat 10½ pounds of air and 1 pound of coal we find it less than a third of that required to fully preheat the air and the fuel. But this alone releases enough high-level heat to calcine another ¾ pound of lime and the resultant 3¾ pounds of lime raises the preheat further and the cumulative effect of this one improvement, if made 100 per cent. effective, is to increase the lime production to 4 pounds per pound of coal.

Reductions in the other wastes of high-level heat have the same cumulative effects not only of themselves but upon each other, and as they

(*Continued on page* 93)

Present Status of O.P.A. Regulations Affecting Liming-Material

By HENRY A. HUSCHKE
Agricultural Chemicals Section
Office of Price Administration

another P and Q exclusive

REVISED Maximum Price Regulation 386 is the O.P.A. document that governs the maximum prices of all agricultural liming materials at all levels of distribution. It has evolved from three previous regulations, all of which were found deficient as truly workable instruments of price control in this industry. During the seven months that R.M.P.R. 386 has been in effect, experience has indicated that it is fair, equitable and workable. Before attempting to explain its several features, it is believed that the industry will be interested in examining the background of experience which led to the issuance of the present regulation.

In conformance with the purposes of the Emergency Price Control Act of 1942, the Office of Price Administration issued in April of 1942 the General Maximum Price Regulation. This froze prices of most uncontrolled commodities, including agricultural liming materials, and established as price ceilings the highest price charged for a commodity or product to purchasers of the same class during March, 1942. Its purpose was to halt the inflationary price rises that were then occurring in many fields.

Frankly, at that time we were not sure what its impact would be on this industry. However, it took but a few months to find out. In June of 1942 the Agricultural Adjustment Agency asked for bids in the Northeast and East Central Regions. When those bids were opened, we learned that if the A.A.A. was to obtain its desired tonnage of materials it would be necessary to do one of two things. Either the A.A.A. would have to make purchases at higher-than-ceiling prices, thereby violating the provisions of the General Mamixum Price Regulation, or the O.P.A. would have to recognize that costs of producing liming materials had increased. You see, many of the prices that existed in March, 1942, were established by competitive bid one, two, or three years previously. Producers who were selling to the A.A.A. were bound by a 12-month contract so little opportunity existed for price movement during the fall and winter of 1941 and 1942. As a result numerous prices were frozen at low levels.

After making careful study of the facts it was decided to construct an individual price-adjustment procedure on sales to the A.A.A. It was known as Amendment 9 to Supplement Regulation 14 to the General Maximum Price Regulation. It permitted a producer to add the same margin to his production cost at the time he made application as he enjoyed at the time he last entered into contract with the A.A.A. Under that procedure about 140 individual price adjustments were made. It served its purpose well in that it loosened the girth strap enough to allow a free flow of liming materials to farms under the Conservation Materials Program of the A.A.A. However, it created an undesirable situation in that it established prices on sales of the A.A.A. which in many cases were higher than the producer could legally charge to farmers, dealers or truckers. Also, it was incomplete in its scope. It left many pricing problems unsolved. It was revoked in May, 1943, the same month in which Maximum Price Regulation 386 was issued.

Henry A. Huschke

When M.P.R. 386 was issued, the defects just mentioned were corrected and the industry had a regulation that was tailored to fit it. During the eighteen months of its existence it worked well, but in the light of changing conditions, weaknesses appeared and it needed refining and clarifying. So in October, 1944, the present regulation, R.M.P.R. 386, was issued.

Establishing Ceiling Price Revised M.P.R. 386 has all the essential features of its predecessor plus a few new ones. Section 10 still gives a producer the choice of three ways to establish his bulk, f.o.b. plant ceiling price. Under Rule 1 he may retain the highest f.o.b. plant price that he charged each class of purchaser during March or April, 1942. Rule 2 permits him to continue the price at which he contracted with the A.A.A. between September 12, 1942, and May 15, 1943, and it further provides that he may extend the price increase he got on sales to the A.A.A. to other classes of purchasers. And Rule 3 provides a formula whereby a producer may compute a new maximum price by adding to his base-period price his increase in production cost.

Rule 3 has been rewritten and is, we think, easier to understand. Under this rule, the establishment of a new price is broken down into 4 steps:

Step 1 is to compute the cost per ton to produce agricultural liming material during the base period. (The base period means the calendar or fiscal year 1941 or the first 12 months in which a producer was engaged in business subsequent to January 1, 1941.) This is done by adding all the items of production cost for the year and dividing that sum by the tons produced. Where a producer can not separate liming-material cost from his cost of making other products, he may base the computation on the entire output of his plant of all products. Also, where a producer operates more than one plant, he may figure each one separately or combine the data into a single computation.

Step 2 is exactly the same com-

putation as Step 1 but covers the 6-month period ending April 30, 1943.

Step 3 consists of subtracting the figure obtained in Step 1 from the figure obtained in Step 2. The difference is added to the base-period price to each class of purchaser. However, the amount added may not exceed 30 cents per ton or 15 per cent. of the base period price, whichever is greater.

Step 4 is to mail all these computations to the O.P.A. at Washington, D. C. Upon receiving them we check the figures to see that they conform with the regulation and, if they do, we mail a postal card to the producer which informs him that his price has been received and filed. If there is something wrong about his computation we inform him of it by letter.

Costs and Prices Computation of a new maximum price under Rule 3 is a relatively simple matter. The producer adds all the items of production cost to obtain the total figure for the base period. Let us assume that total to be $18,368.00 and that 22,400 tons was produced during the period. He divides $18,368 by 22,400 tons to obtain an average cost of production of 82 cents per ton.

A similar computation is made for the 6-month period ending April 30, 1943, and the cost of production is found to be $1.17 per ton, an increase of 35 cents per ton over the base-period costs.

The producer's average base-period selling price is assumed to be $1.10 per ton. Rule 3 permits him to add to that price not over 30 cents per ton, thereby resulting in a new ceiling price of $1.40 per ton.

During the spring and summer of 1943 we were finding that Rule 3 did not meet the requirements of a certain segment of the industry. It was during that period that the crushed-stone business was dropping off and with it the tonnage of agricultural limestone which in many cases was produced as a co-product. The only way that these producers could maintain their output of ag-stone was to make it as a primary product. This involved increased costs which the O.P.A. was willing to recognize but which could not be brought to light under the provisions of Rule 3. So Section 8(b) was written into the regulation.

This new section permits the Administrator to adjust the maximum price for a producer of agricultural liming material who shows in an application for adjustment that: (1) there exists a shortage of supply, (2) his maximum price will not permit him to continue production without substantial hardship, (3) the loss of his production would force purchasers to resort to higher-priced sources of supply, and (4) Rule 3 will not give him the required measure of relief. The amount of relief that may be given under this new section is limited to the increase in production cost between the base period—1941 for most producers—and the most recent 3-month period preceding the application.

The only other change of importance that was made when M.P.R. 386 was revised applies to operators of portable equipment. We found that a few operators with high ceilings were moving around within states and across state lines and carrying their high ceilings into areas where existing ceilings were low. This was causing trouble for both the O.P.A. and the A.A.A. Now, under Section 13, a portable operator may take his ceiling with him, provided there is no other portable operator with a lower ceiling price in the area into which he is moving. In the event that there is a lower ceiling in that area the producer who is moving in may not exceed it.

Effect on Production Now let us examine the effect of price control on this industry. R.M.P.R. 386 is a liberal price regulation. Its provisions were made liberal to assure the supply of a commodity which is considered essential to the war food program. Therefore we can measure its effectiveness by answering two questions: Has it prevented the industry from maintaining production of liming materials? Has it kept prices at a reasonable level?

In answering the first we will have to use a few figures. According to the National Lime Association, which conducts an annual survey, the consumption of all liming materials has been running as follows: in 1940, 13.4 million tons; 1941, 15.9 million; 1942, 17.9 million; in 1943, 17.8 million tons. These figures which presume to cover all the materials *used* include farm-dug marl and all the by-products.

The Bureau of Mines which reports agricultural limestone *produced* shows the following in millions of tons per year: 1940, 8.7; 1941, 11.9; 1942, 13.7; and 1943, 14.5. The trend is about the same in both sets of figures even though the totals do not agree. It is too early to know the tonnage for 1944. However, the consensus is that 1944 should equal 1943, possibly surpass it. So, with that picture in mind, we can safely conclude that our price regulation has not been a barrier to production. This industry has been harassed by all kinds of production and distribution problems—labor, difficulty of obtaining repairs and replacements, tires, gas, etc., but it has come through with flying colors.

It also is of interest to note that under price control 83 new producers have started in business. At least they have filed prices with us and we assume they have started in business. Operators who cease production are not required to notify the O.P.A. so we have no record of how many dropped out.

Are Prices Reasonable? As to the second question: Has the regulation kept prices at a reasonable level? Here, again, we must use a few figures and what we state below refers to f.o.b. plant prices only. We know that there are about 1,000 producers of liming materials in the United States. Of this number, producers of about half of the tonnage have obtained adjustments averaging about 22 cents per ton. Thus, for the industry as a whole we may say with considerable accuracy that to-day's f.o.b. plant prices are between 10 and 12 per cent. higher than they were in 1941.

Here is a record of which you may be proud. With your coöperation we have held the line well. And this in the face of rising labor costs which are so big a factor in limestone production, representing, as they do, from 25 to over 50 per cent. of the total cost of production. Other government agencies also have been very helpful to us, especially the Agricultural Adjustment Agency, which purchases about two-thirds of all the liming materials produced.

Farm Buying Power It might be of interest to examine this subject a little further. Agricultural liming material is one of a large group of commodities that enter into the computation of parity prices of farm products. The weight of liming material prices in that computation is small, almost negligible. To illustrate, in 1943 farmers spent about $425,000,000 on fertilizers and lime. Of this about $55,000,000 represented liming material purchased. That same year the total cash farm income was $21,207,000,000. Therefore, the cost of

liming materials was equivalent to 2.6 mills out of each $1.00 of gross farm income.

The figure on gross farm income —$21,207,000,000—is a plain clue as to how farmers have fared under price control. In a recent speech before the National Grange, Chester Bowles, Administrator of the O.P.A., went into this subject in considerable detail.

In part, Mr. Bowles stated that during this war the average of all farm prices rose 102 per cent. from 1939 to 1943 and during World War I, from 1914 to the peak of 1919, the rise was 113 per cent. In each war, therefore, farm prices more than doubled. However, when we examine the prices that farmers pay for the things they buy, there is an important difference. During this war the average of all prices paid by farmers was 31 per cent. higher in 1943 than in 1939. During the last war, between 1914 and 1919, these same items increased by 94 per cent.—three times the increase that has been experienced under price control.

This means that the spread between farm prices and the prices which farmers pay is greater now than it was during the most favorable months of the World War I period. If such a price relationship can be maintained, at least in part, it should rebound to the benefit of liming-materials producers and sellers during post-war years. As in the case of fertilizers, the farmer demand for liming materials follows closely the purchasing power of the farmer. If the ability to buy is reduced by shrinking the gap between farm income and expenditure, the demand for most things that he buys will go down.

So it appears to be to the advantage of all industries that serve the agricultural market to continue price control until a normal balance between supply and demand removes the dangers of inflation. Just when that may be is difficult to foresee. However Administrator Bowles has stated it as the policy of the O.P.A. to remove controls on each product or in each industry one after another whenever the danger of inflationary price rises has disappeared in that particular field.

This industry has reached new peaks of production during the trying war period. It would seem that if there is a freer supply of labor and equipment for production and distribution, the level of production could attain a balance with demand early in the post-war period. Should this be the case, the industry may be among the earlier ones to be relieved from price regulation. Until that time, we in the O.P.A. solicit your continued coöperation and sympathetic understanding of our mutual problems.

Hopkinsville *(from page 89)*

new pulverizer had just been mounted on its foundation, and delivery of the 250-horsepower drive motor was expected within a few days.

An interesting feature of the plant is the Parsons dust-collector which is connected to the Austin No. 107 primary gyratory crusher, to the Symons short-head and standard cone crushers and to the two Simplicity double-deck vibrating screens. This installation was made about four years ago solely to eliminate the dust nuisance during dry periods, but it is paying for itself in the 7 or 8 tons per day of minus-325-mesh material recovered and marketed as mine dust.

The new 42 by 48 inch hammermill being installed.

A. W. Partee, A. M. Andrew and W. G. Trice are co-owners and operators of the Hopkinsville Stone Company.

Lime Kilns *(from page 90)*

build up the production of lime per unit of coal they build up the air and fuel preheat so that it is no longer necessary to make that recovery 100 per cent. to get 5 or even 6 pounds of lime per pound of fuel.

Some of the prevalent confused thinking would have us believe that the efficient use of high-level heat requires high combustion temperatures. If that were true such efficient processing would be suitable for cement burning but quite unsuited for lime burning, where peak temperatures may best be well under 2,500 degrees F. The time rate of combustion is the forgotten factor. For high capacity and high efficiency it is necessary to delay combustion. The British generally think we Americans are "all wet" in our use of the Eldred system of combustion-gas recirculation to delay combustion. Apparently our rotary-kiln plant designers have agreed with the British. But the best shaft-kiln results have involved the use of the Eldred system and we will not get satisfactory rotary-kiln performance until we follow suit.

The world is suffering from a fuel shortage. Perhaps we will be limited next winter to 80 per cent. of the past year's fuel allotment for domestic heating. We have had several years of government pressure for home insulating. How inconsistent it is to be feeding thousands of tons of fuel into some good-sized rat holes, when it is so much to the interests of both kiln operators and the general public that steps be taken to conserve in places where conservation really counts.

Impossible to get equipment? Priority handicaps? The plain facts should be enough to overcome any such restrictions. There is not one really efficient rotary-kiln lime plant in the world. It is just about time for someone in the lime industry to do one of those jobs that the world has been saying so frequently "can't be done."

Hercules Publishes Book on Block Caving Methods

The first practical book on block caving, a production method used in some of the nation's biggest underground mines, has been published by Hercules Powder Company.

Titled *Mining by Block Caving*, the book is a compilation of articles written for *The Explosives Engineer* by Professor Phillip B. Bucky, School of Mines, Columbia University. Professor Bucky, as consulting engineer to a number of large mining companies, has played an active role in advancing and improving this type of production.

To serve those interested in block caving as a possible method to be used in their properties, Professor Bucky visited many mines where the method was being used. Three nonmetal and six metal mines are described.

The handbook is illustrated with diagrams of methods used and includes information about general operating data, wage rates, orebody dimensional factors, and considerable other information concerned with this type of mining.

Private Agstone Plant in Georgia Becomes Large Commercial Producer

New Type of Loader Is Used for Stripping and Quarry and Plant Loading

By WILLIAM M. AVERY

● General view of plant with bulldozer shovel resetting a drive unit after overhaul job.

The old and somewhat hackneyed axiom of newspaper circles that when a man bites a dog it is definitely news, while the reverse definitely is not, might with some exaggeration and qualifications be applied to the agricultural limestone operations of Dermot Shemwell & Sons of Albany, Georgia. Most agstone operations are started because there is a local demand for their product. This one was started by a plantation owner to supply his own needs because there was no local source.

Dermot Shemwell & Sons operate a prosperous 1,500 acre plantation about 10 miles west of Albany, Georgia, in a locality whose yellow-pine forests eloquently reveal the lime-impoverished condition of the soil. As scientific planters the Shemwells would have welcomed with open arms the establishment of a local source of agricultural limestone, for the need and the market were both at hand. About six years ago, convinced that the mountain was still as immovable as it had been in the time of Mahomet, they began producing agstone solely for their own use from a 400 acre deposit on the farm.

More for the purpose of enlightening their neighbors than to convince themselves of the benefits of liming, the applications were limited at first to half of any particular pasture. The cattle "caught on" almost immediately and practically wore out the limed areas while maintaining a strict boycott in regard to the adjoining unlimed sections. The neighboring farmers were somewhat slower in their reaction, but in less than two years the Shemwells found themselves flooded with requests to increase their production to make the material available for general sale. This they did and operations are now conducted as the Armena Lime Company.

The original method of production had been of necessity somewhat primitive. It consisted of a small O.B. Wise mill to which the stone from the quarry was delivered in wheelbarrows. With the decision to produce agricultural limestone commercially there began at once a program of expansion and improvement that is still in progress today. The quarry now covers roughly two acres and the working face is about 45 feet high by 300 feet long. A Bucyrus-Erie TD-9 Dozer Shovel mounted on an International TrucTractor, and a P&H No. 150 gasoline shovel, which can be equipped with either a dipper or a drag, are used for both stripping and recovery.

The blast-holes are drilled with a Cleveland Model DR-30 wagon drill and air is supplied by a 210-c.f.m. Schramm compressor which is mounted on a truck. Up to 30 holes in two or three lines are shot at one time, using du Pont powder and electric caps, and up to 300 tons of the relatively soft rock is brought

● Bulldozer shovel loading stone into truck in quarry. Portable compressor and drill in background.

● One of the four 6-ton spreader bodies owned by the company in operation. Two 10-ton units are also used.

down at an average explosives cost of 4 cents per ton.

Three 2 cubic-yard Ford dump trucks make the ¼ mile haul from

● Versatile bulldozer shovel removing trees in stripping of overburden from deposit.

the quarry face to the 18- by 30-inch McLanahan & Stone primary crusher, which is driven by a 60-horsepower PK-40 International gasoline engine. Reduced to minus 3 inches in size, the stone is discharged onto a 20-inch by 75-foot Barber-Greene belt-conveyor, which in turn discharges on a 2-inch bar grizzly. The plus-2-inch stone drops into a 12-t.p.h. O.B. Wise slugger-type hammermill, while the minus-2-inch goes to a Jeffrey swing-hammer pulverizer, rated at 10 t.p.h. Two chain-bucket elevators deliver the discharge from the pulverizers to the single-compartment 120-ton storage bin from which the trucks are loaded. A 12-inch diameter Link-Belt screw-conveyor (unenclosed), at the top of the 75-foot-long storage bin, distributes material uniformly over the length of the bin. Adjoining the bin is a storage warehouse with capacity for 1,000 tons of finished product. When the storage bin fills up, the material overflows

● The 18- by 30-inch primary crusher with its flat belt drive.

through openings in the side into the warehouse from which it is loaded into trucks by means of the TD-9 Dozer Shovel.

The company operates four 6-ton Baughman spreader bodies, two on Ford and two on International trucks, and has on hand two 10-ton Baughman spreader bodies awaiting the delivery of new trucks. In addition four trailer trucks are used for making deliveries, two Fords and one Dodge, of 10 tons capacity each, and a recently purchased 12-ton International KS-7. Since most of the production of the plant is sold on a spread basis, the practice is to use the trailers for stock-piling at distances up to 100 miles from the plant and reload into the spreaders

● Dozer shovel loading agstone from storage into 12-ton truck.

for actual delivery. The reloading is accomplished with a 28-foot belt-loader, which is moved from one location to another by truck. Some railway shipments are also made using the belt-loader for loading box cars and dumping directly into gondolas from a ramp at the siding.

Under optimum conditions this plant can pulverize 25 to 30 tons of stone per hour, and it is possible to operate throughout most of the year. Heavy rains in the spring cause some delay, and wet stone, particularly right after stripping, is the only serious problem with which the plant has to contend. To reduce this as much as possible every effort is made to keep the stripping operation

● The 210-cubic foot truck-mounted air compressor which supplies quarry drill.

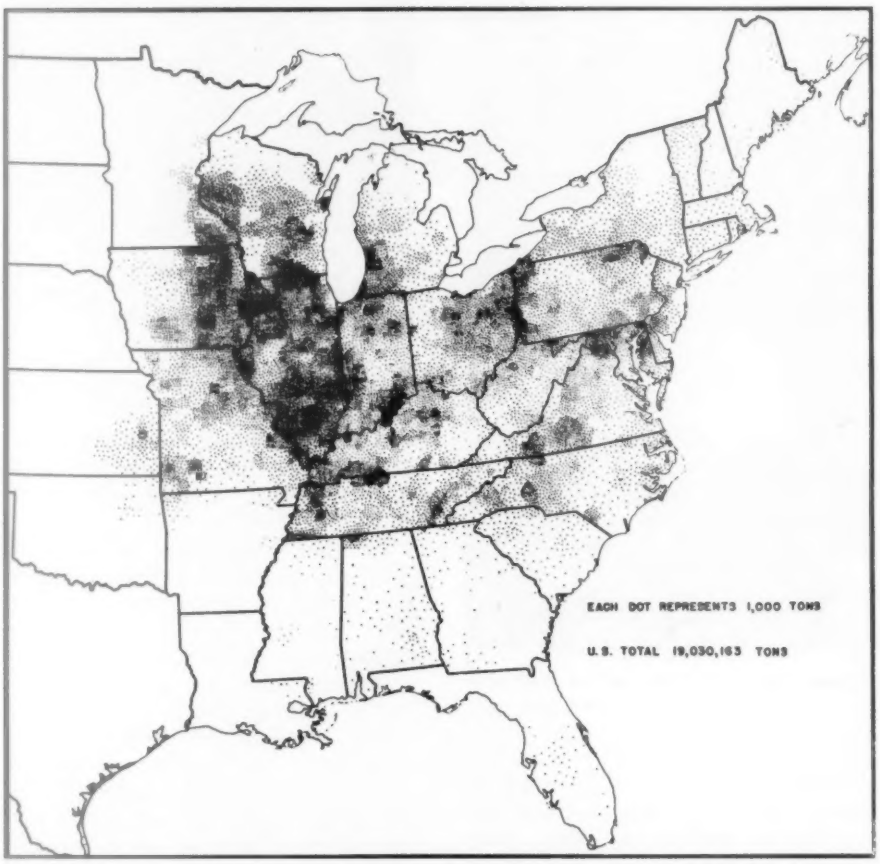
● E. R. Culbertson, production manager, and Dermot Shemwell, Jr., in charge of sales and management. Dooley Culbertson at left.

well in advance of requirements. Exceptionally wet stone is accumulated in small piles near the plant until the moisture content has dropped sufficiently to assure economical handling.

Of the 1,500 acres which comprise the Shemwell plantation, some 500 to 600 acres are under cultivation, primarily in oats and barley. High-grade beef cattle graze on the rolling pastures and registered Tennessee walking horses are bred and raised. The Shemwells attest with enthusiasm the importance of the role which their self-engineered liming program has played in the success of their farming operations. As operators of one of the few agricultural limestone producing plants in the state of Georgia, they are helping to make these advantages available throughout a large part of the state. They now also operate the Meadwell Lime Mines, Opelika, Alabama, where agstone and other limestone products are made.

● The 12-inch open screw conveyor which distributes agstone in storage.

Demand for Agstone Overtaxes Country's Production Capacity



● Lime applied under 1943 agricultural conservation program of the A.A.A.

another P AND Q exclusive

A year ago January it was made widely known throughout the limestone industry that the A.A.A. would need 15,000,000 tons of liming materials in 1944 to meet the requirements for contract distribution. When the books were closed at the end of the year it was found that this goal had been missed by only a small margin; 14,600,000 tons actually delivered. At the same time the over-all tonnage of agricultural lime used throughout the United States also appears to have established a new record.

At any time this would be an unusual achievement. During the war period it is even more remarkable. It took the combined efforts of many people to accomplish it. The federal agencies responsible for expediting production and distribution rendered valuable help, but the men of the industry itself really did the job. Standing just a little to one side of the industry people were the A.A.A. county and state committeemen. They helped where they could with equipment and man-power problems and gave coöperation and encouragement to each new or expanding enterprise. But if the industry had not had the vision and the energy to develop and carry out schemes for meeting production and distribution problems that were never considered in times of peace, the goal would not have been reached.

Supply Short of Demand

The generally excellent results of last year's operations were not uniform throughout the country. So far as contract material is concerned, the heaviest consuming area—the North Central Region—fell 1,000,000 tons short of moving to farms all the limestone that it had hoped to get out through A.A.A. contracts. However, as the goal had been set high, it was something of an accomplishment to do even this well. The East Central Region fell short about 700,000 tons and the Northeast was 200,000 tons behind its estimate. The Western and Southern Regions provided the year's favorable surprises by producing and distributing far in excess of the goals set for their states. Western exceeded its estimate by 300,000 tons, while Southern went 1,200,000 tons over. Much of the latter tonnage moved from areas outside the South, something which regional estimates had not taken into consideration.

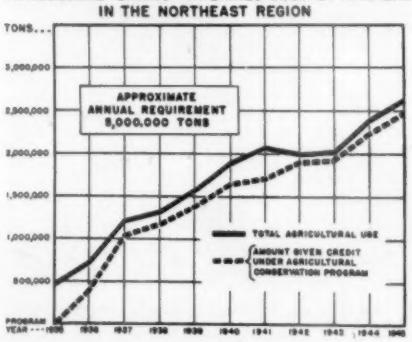
Under the agricultural conservation program each state has a share

By D. W. AITKEN
Office of the Chief, Agricultural Adjustment Agency

of the funds available which it may budget for the various practices on which credit is given. The degree of emphasis on particular practices, such as the application of liming materials, depends upon local factors; for example, prospective availability of materials, coöperation of other federal and state agencies in promoting soil-conservation measures, the extent of erosion, which in turn is related to topography and rainfall, and others of this nature. Also, suppliers of materials are sometimes located so as to lead to concentration of deliveries in one area rather than another. Sources of supply in one state may exceed the orders available for placement, while another state may find the situation reversed. Adjustments of this situation often can not be made without involving excessive transportation.

It is too early to know the exact total tonnage of liming materials that moved in 1944 under the impetus of the agricultural-conservation program. That figure, which is really the important one, is summarized from applications for payment after they have been filed and paid. It includes the quantity delivered under A.A.A. contracts and that

AGRICULTURAL LIMING MATERIALS USED BY FARMERS IN THE NORTHEAST REGION



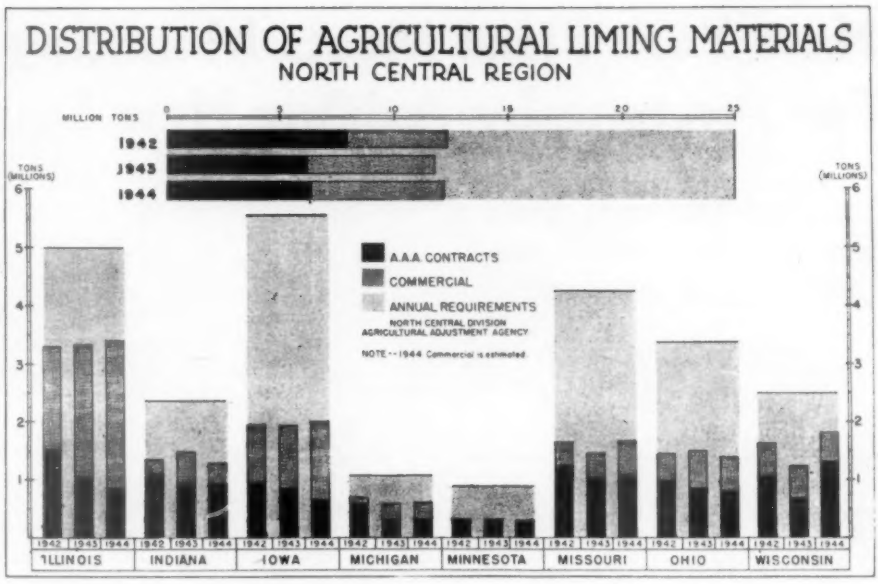
which was purchased direct by farmers and used according to program specifications; thus it represents the full accomplishment of the program as far as liming materials are concerned. This tonnage increased from 3,600,000 in 1936 to 19,000,000 in 1943. Because program years varied in length, the increase was not consistent from year to year. It has, however, been steady and persistent.

Distribution of Use The dot map gives the distribution pattern of the 19,000,000 tons used under the 1943 program. The heaviest concentration of dots in particular counties reflects the different factors discussed above rather than the intensity of need for liming materials. With the exception of the Southern Region, the dot distribution gives a general picture of the extent to which progress has been made throughout the calcium- and magnesium-deficient areas of the country in tackling the problem by means of the agricultural conservation program. When the score is known for 1944, the map will show much greater dot density in the southern deficient areas.

The two accompanying charts tell the story for two of the big lime-using regions. The approach in depicting the situation is different in each case. For the Northeast Region there is shown the whole picture from the beginning of the program. The most significant line is the top one. The contribution of the agricultural-conservation program in pushing this line up is shown by the second line. This includes tonnages moved commercially and those which went out under A.A.A. contracts. Both influenced substantially the magnitude of the total.

For the North Central Region the chart covers the past three years. It divides the total agricultural-conservation program tonnage between that which moved on A.A.A. contracts and that which did not. The tops of the pillars represent tonnages comparable to the second line on the Northeast chart. The vast field of unsatisfied requirement shows up clearly, but the advances made are also significant.

What the Soils Need So much for the past. The A.A.A. is looking ahead. There are goals up and beyond the accomplishments of other years. A real war-time job has been done. We can expect as good a record this year. But for the years after equipment and man power become available we turn to the agronomists for advice, to those to whom the soil is a challenge. There a whole new field is revealed.



Studies of soil and crop requirements are not complete, but preliminary figures are well above past usage. For the whole country an annual application of 51,000,000 tons is desirable. Here are the figures by regions:

	Tons
East Central Region	9,305,628
North Central Region	25,139,985
Northeast Region	4,723,205
Southern Region	10,742,589
Western Region	1,468,787
Total	51,380,194

Producers won't find things easing up in 1945. Equipment is wearing out faster than it can be replaced. Truck and tire problems haven't been solved. Though liming materials will maintain their place in the scheme of war-time things, they will be more and more sharing shortages. Ingenuity will count for more; accomplishing much with little will be the order of the day. There is no solution in sight for man-power problems. Here, especially, farmers and their suppliers are on common ground. There will be fewer youngsters but more discharged veterans. Where they can be used, more prisoners of war will probably be available.

Product Considered Essential There will be no let-up in the splendid help being given by the W.P.B., the W.M.C., and the O.P.A. in facilitating production and distribution. They will continue the recognition they have given to liming materials as an essential commodity. As the industry is no longer considered seasonal, no special spurts of attention can be expected.

Producers and distributors must continue to anticipate their needs well in advance. The A.A.A. county and state committees should be made aware of these needs so they can be measured in relation to other requirements of the farm community. The facilities of all the W.F.A. agencies are continually available to the industry for any assistance they can render.

The future of the agricultural-conservation program is an integral part of federal farm activities. Its value to the nation is well recognized. In substance it will probably continue, but in form it may change. The plan of operation is not meant to be self-perpetuating. As farmers come to realize that the national interest in conservation of soil resources is identical with their own personal interest, they may be expected to carry more and more of the responsibilities connected with it. The program is being administered with that in mind. In 1945, for example, farmers are bearing a larger share of the materials' cost through increases in their cash contribution.

Arrangements are available to all states for procurement on purchase order as well as on government contract. This arrangement brings the farmer closer to the producer and encourages the participation of local truckers in the merchandising of liming materials. It gives major responsibility for year-round movement to farmers as a whole and to the trade and lessens the role played by A.A.A. committees in this phase of the activity.

Closer attention will be given to integrating the use of liming materials with other mineral elements essential to soil fertility and efficient production. This has not been possible during the war years, because production programs for fertilizers

(*Continued on page* 100)

New York Plant Meets Mounting Demand For Agstone by Adding New Equipment

Unusual Methods Used For Storing and Loading Bagged Agstone

By W. E. TRAUFFER

another ON THE SPOT report

EASTERN Rock Products, Inc., of Utica, New York, one of the largest aggregate producers in that state, was one of the first in that area to see the future in agstone production and to install the necessary equipment for its manufacture. In 1937 a Kennedy-Van Saun air-swept ball mill was installed in the Oriskany Falls crushed stone plant, along with other related equipment, for this purpose. This mill was kept busy grinding down sizes of stone not otherwise in demand until recently when the demand for aggregates fell off sharply and agstone became an increasingly important factor. By early in 1944 the local demand exceeded the supply and, at the request of the U. S. Department of Agriculture, a second similar mill was installed. This was in operation on May 1 of that year and other improvements necessary to the proper functioning of the enlarged plant were finished later.

The only interruption to the production of agstone occurred on February 24, 1940, when a fire destroyed this department and the conveyor and bin from which it was supplied. Thousands of paper bags were also destroyed. Reconstruction was begun at once with the salvaged mill and its accessories and production was resumed on March 25, 1940.

The 1944 improvement program began with the pouring of the new mill foundations in February. Then a new 1,200-foot railroad siding was installed exclusively for agstone loading and the existing agstone car-loading belt-conveyor was extended 50 feet across the three existing tracks to reach this siding.

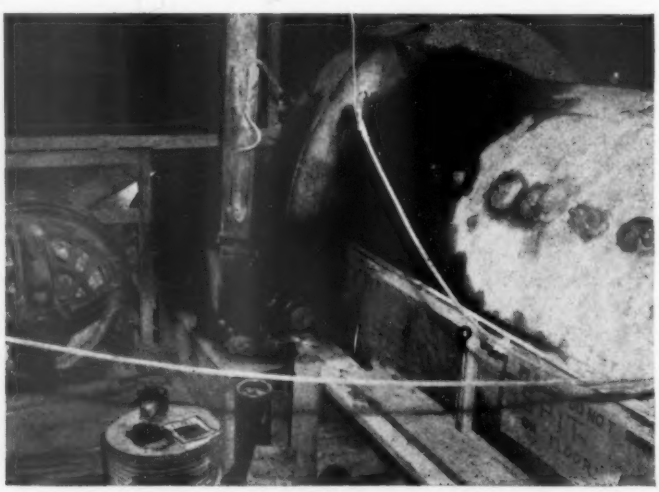
The increase in output also required the installation of a second 3-tube bag packer and equipment for the return of spilled dust to the bins was also added. This effected a dust saving of from 3 to 7 tons daily depending on the amount of packing done. A dust collector was also installed to reclaim the dust from the vented air from the mills.

The crushed stone plant has an average capacity of about 150 tons per hour. It and the quarry are operated 58 hours weekly but the agstone department operates 24 hours daily for a 7-day week. In 1943 the single mill produced 55,000 tons of agstone. In 1944, with the second mill producing part of the year, the output was 85,000 tons. The 1945 output, with both mills working full time, is expected to exceed 100,000 tons. The company holds A.A.A. contracts for 116,000 tons.

The agstone is ground to a fineness of 100 per cent. through 20 mesh and 75 per cent. through 100 mesh. The guarantee requirement is 100 per cent. through 20 mesh and 40 per cent. through 100 mesh. The product contains about 50 per cent. calcium and 1 per cent. magnesium oxide equivalent. Screen analyses of the product are made daily by the company and every 2 or 3 weeks by A.A.A. inspectors.

Agstone pulverizing building with conveyor from screening plant at right.

Because of the interrelation of the crushed- and agricultural-stone departments a brief description of the former and of the quarrying operations is given. The physical layout is unusual. The quarry is located on the uphill side of State Highway No. 12B and a belt-conveyor carries the stone from the primary and secondary crushers over the highway to the screening plant which is on the side of the hill. The loading tracks are at the foot of the hill about 60 feet below the main plant level.



The two 6½ by 11-foot ball mills below. The new one is at left.

General view of plant with crushing and asphalt departments in foreground; agstone department in background.

The bagged agstone-storage building which has a capacity of 9,000 tons. Agstone and screening plants in background.

The drilling and blasting methods are conventional. The stone is loaded by shovels into 12-ton trucks which dump it on a 48-inch by 12-foot Kennedy - Van - Saun apron feeder which is inclined 15 degrees upward toward its discharge end which is 10 feet below quarry level. This arrangement makes it possible to pile up as much as 25 tons of stone on the feeder which pulls it out and up in a fairly even flow. The operator seldom has to stop the feeder except when there is a delay in the quarry, in which case he leaves enough stone on the feeder to absorb the shock of the next load. This practice greatly reduces the wear on the feeder and practically eliminates the danger of breakage.

The feeder discharges the stone into the Buchanan jaw primary crusher and a belt - conveyor carries the stone to the secondary crusher, where it is further reduced by a Kennedy-Van-Saun gyratory crusher and a 5½-foot Symons cone crusher. Six Tyler vibrating screens are used for sizing the stone into side-hill bins. Up to this point no water touches the stone so that fairly dry material is always available for the company's agstone and aggregate-bituminizing plants at this location. Two revolving screens at the terminals of the two stone car-loading conveyors are used to wash crushed stone before it is loaded for shipment. The main plant structure has been converted almost entirely from wood to steel construction during the past seven years.

During the winter the crushed stone plant is shut down but not the agstone department. This is supplied from stock-piles of 1- to 2-inch stone which, when recrushed, gives a drier feed than would be possible if finer stone was stored. When the crushed stone plant is in operation the feed for the agstone department usually consists of the dust from the vibrating screens. During wet weather, however, there is little dust and stone of 1-inch size or smaller is used.

The dust or stone, as the case may be, is carried on a belt conveyor from the main plant bins to a 350-ton steel mill-feed bin in the agstone department. This is always filled at the end of a day shift in order to provide enough material for the night shift. This bin has a split bottom for the two mills which are fed by means of two Kennedy-Van-Saun table feeders. Tickler systems are used to indicate whether or not material is flowing into the mills.

The two Kennedy-Van-Saun 6½-by 11-foot air-swept ball mills are steel-lined and are each loaded with 9 tons of Kennedy 1- to 3-inch drop-forged steel balls. They are driven at the rate of 26 r.p.m. through V-belts by 150-hp. electric motors, one a G. E., the other a Westinghouse. Each mill has a Kennedy-Van-Saun photo-electric cell automatic control system which has considerably increased output by keeping a uniform material level in the mill. This system consists of a tube in the discharge end of each mill with its bottom end slightly above the bottom of the discharge throat. When the level of the material in the mill rises enough to plug the opening in this tube a vacuum in a tube in the control box is broken and a column of glycerin falls, activating a relay which cuts in the lower 80 per cent. speed of the 2-speed slip-ring feeder motor. When the normal mill material level has again been attained the vacuum is restored and the feeder motor resumes its normal 100 per cent. speed. This system has entirely eliminated plugging of the mill. Under the old manual-control system the mills plugged up frequently causing interruption of the feed until excess material was swept away by air flow.

Each mill has a coal-fired furnace which maintains a temperature of 160 degrees F. at the discharge end of the mill. The closed-circuit system consists of a fan, a 6-foot-diameter cyclone, a vent to a Sly dust collector which serves both mills, and the return air piping. No material is returned to the mill from this circuit. From present indications this dust collector will soon repay its cost in the value of the material saved.

The agstone from the cyclone and the collector drops into a 32-foot-diameter by 36-foot wood-stave silo. From this the agstone is fed into the two St. Regis 3-spout bag packers, one of which is usually used for car and the other for truck loading. Each packer discharges its bags on a separate conveyor but a cross belt-conveyor can be moved to connect them so that both packers can be used for either car or truck loading as desired. The car-loading conveyor extends to the loading tracks where a short wheeled conveyor is used for loading the bags into box

Interior of agstone storage building with chute from conveyor above.

● The hillside crushed stone storage bins with two conveyors to re-rinsing and car-loading stations. Agstone loading conveyor to separate track is in background.

cars. A screw-conveyor recently installed under the packers carries spilled dust to a new Jeffrey bucket elevator.

On the car-loading conveyor there is a baffle which can be used to shunt the bags from it onto a return inclined belt-conveyor to the top of the bagged-material storage building. This wooden building is 200 feet long, 50 feet wide, and 32 feet high and has a capacity of 9,000 tons of bagged lime. Running almost the entire length of the roof of this building is a conveyor with baffles which can be dropped into place over any of 8 discharge gates. Swinging chutes, attached to the gates, and controlled by block and tackle, lower the bags to any point or level over the entire area of the building. With this system the bagged agstone can be, and is, stacked 55 layers deep, almost the full height of the building.

About two-thirds of the bags can be loaded from the piles into the trucks by gravity through chutes. The layers too low for gravity handling are loaded by means of portable belt-conveyors.

Usually about 2,500 tons of bagged agstone is loaded direct into trucks or cars weekly *via* the loading conveyors. As much as 1,500 tons in addition has been loaded out into trucks from the storage building, a decided advantage when there are surges in demand. Such surges were much more common before the A.A.A. entered the agstone picture and leveled off the peaks and valleys in the demand for this product, but they still occur at intervals.

This operation is under the direct supervision of Carleton Sykes, superintendent, and J. V. Owens, general superintendent of the company. Other officers are Hal V. Owens, president and general manager; and C. A. Munz, vice-president and sales manager. In addition to the crushed stone, agstone and aggregate-bituminizing plants at Oriskany Falls the company also operates crushed gravel and industrial sand plants at Boonville, and a sand-and-gravel plant at Trenton.

Aglime Use (*from page 97*)

have met with only limited success. Studies are going forward to determine long-term conservation needs and the relationship between various practices which should be expanded. From these should develop increasingly worth-while programs for the national welfare.

An awakened interest is being shown by all liming-materials producers in the potentialities of their product. Progress through united effort is the plan of groups now organized and in process of organization within the trade. These are good signs. While developments in this field have been long in coming, the advantages are legion and clearly apparent. The A.A.A. is glad to work with all groups and with every segment of the trade in the common effort to advance the purposes of the agricultural-conservation program for the best interests of the nation. A true farm agency, administered by farmers, the A.A.A. places heavy reliance upon trade cooperation.

Sulfur Sales Rising

With the growing need for sulfuric acid in munitions, fertilizer, petroleum, and in many other industries that require it in their production, consumption of sulfur reached a record in 1944. Sales were approximately 12 per cent. larger than in 1943 according to figures released by the Bureau of Mines, United States Department of the Interior.

After a slow start, production increased to about 300,000 long tons per month, and output for the year, 3,218,156 long tons, was 27 per cent. greater than in 1943 and nearly as large as the record total attained in 1942. As sales exceeded production, industry stocks declined 361,901 long tons. Total stocks at the end of the year were still large—equivalent to over a year's requirements.

Western Phosphate Output

A new high record for phosphate rock production in the Western states was set in 1944, the marketed production reaching 298,999 long tons (with a P_2O_5 content of 95,767 tons). This was an increase of 13 per cent. above the previous high of 1942, and 70,319 tons (31 per cent.) more than the quantity sold or used in 1943, according to reports by producers to the Bureau of Mines, United States Department of the Interior. The total value was slightly more than $1,300,000. The production in 1944 came from Idaho and Montana; Utah was inactive. The average P_2O_5 content of the Western states phosphate rock sold or used in 1944 is reported as 32.02 per cent.

The Utah Lime and Stone Company of Salt Lake City, who previously operated two 5-ton Ellernan calciners, are installing a 10-ton unit scheduled to begin operation soon. The firm also contemplates installing a second 10-ton unit in the near future.

The Consolidated Feldspar Company of Erwin, Tennessee, has installed "free air" flotation.

California Oyster Shell Deposit Contains Estimated 8 Million Tons

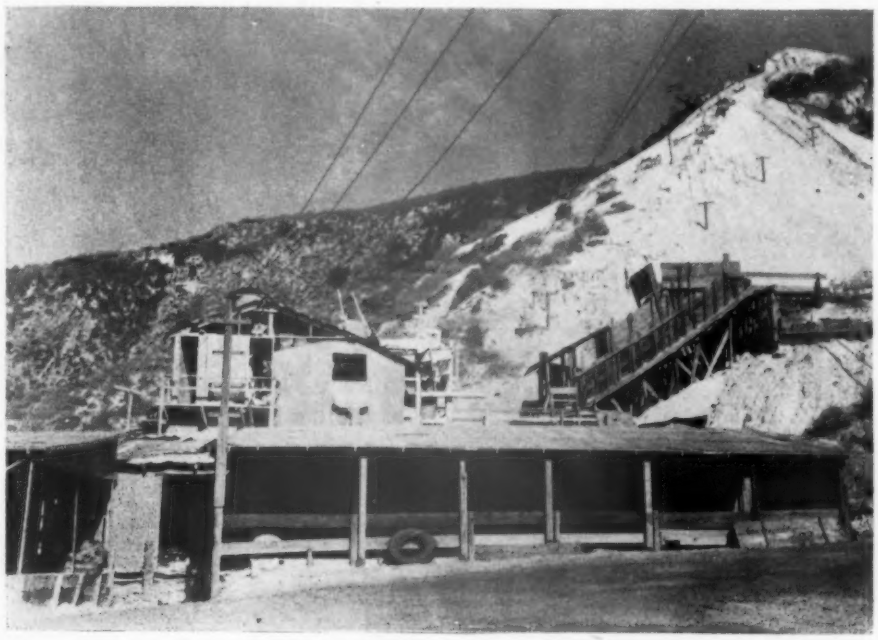
From this Geological Freak in Simi Valley Western Limestone Company Produces 11,200 Bags of Finished Material Per Week

another ON THE SPOT report

ON the summit of Tapo Mountain, rising 2,400 feet above sea level in picturesque Simi Valley in California, a freak of geology has exposed a tremendous bed of oyster shells. The deposit, estimated to contain about 8,000,000 tons of pure calcium shell limestone, is judged to be several million years old. The shell once lay at the bottom of the sea and in some upheaval reached their present position. Succeeding ages cemented the shell into its present form of shell limestone.

The deposit is being worked by the Western Lime Products Company and the entire output goes into poultry and cattle feed, and for use

By HARRY F. UTLEY



Above—General plant view of Western Lime Products Company. The quarry is at the top at the right.

Below—Supt. J. C. Gillibrand operating the ¼-cubic-yard shovel in the quarry.

on the soil as a liming material. Operations are carried on near the town of Santa Susana, about 35 miles north and west of the company's main offices in Hollywood.

The material is drilled with Thor jackhammers powered by an Ingersoll-Rand portable air-compressor, and is blasted at frequent intervals. A Universal shovel equipped with a ¼-cubic yard bucket loads the shell rock directly into trucks. The shovel, originally driven by a gasoline engine, has been converted to electric power. The processing plant is located a short distance down the slope and two Ford 2-ton dump trucks carry the stone down a single-track road to the plant hopper. One man drives both trucks, one vehicle being loaded while the other makes the 10-minute round trip to the plant.

The trucks dump over a rail grizzly, with bars spaced 18 inches apart, into the 50-ton hopper. The oversize is easily sledged through and the material is fed by a plate feeder into a Universal 24-inch jaw crusher which discharges directly into a 4- by 20-foot direct-heat rotary drier. The drier is oil-fired by a Superior burner and exhausted by a Superior fan. The dried product then passes to a Williams No. 4 hammer-mill and, after further crushing is raised by the 20-foot No. 1 bucket elevator to a 3- by 20-foot revolving screen which removes the minus-40-mesh material and passes the plus-¼-inch oversize to a smaller Williams hammer-mill in closed circuit with the No. 1 elevator. Material between ¼-inch and 40-mesh is carried by the No. 2 elevator up to a Cottrell 3- by 8-foot 3-deck vibrating screen for sizing. This screen has ¼-inch cloth on the top deck, No. 26 mesh on the middle, and No. 40 mesh on the bottom deck. Any plus-¼-inch shell goes back for further crushing and the remaining products

(*Continued on page* 105)

An Open Letter Addressed To Operators of Rotary Lime Kilns

By W. R. CLIFFE

another P&Q exclusive

GENTLEMEN: In going about one hears so many statements, many made loosely, concerning rotary-lime-kiln practice. It occurred to me that an open, sort of informal discussion of the subject might be helpful to those good fellows who are so busy trying to meet their everyday requirements under existing conditions, that they haven't much time for thoughts about operating economy, improved practices, post-war planning, etc.

By way of history, many operators now in the business recall the first rotary kilns for the production of commercial lime that pioneered that industry in the early 1920's. That was really a gigantic step in the right direction. Of course, cement and some other industries had had lots of experience in rotary kilning, but the business of building these first lime units, and, later, marketing their products was tough going. While the product was reluctantly accepted as being superior, it unfortunately had to be recognized that the fuel efficiency of these units did not compare with that obtained in verticals or mixed-feed-kiln practice. Whether this was responsible or whether the industry was content to rest on the knowledge that, in achieving successfully the rotary kilning of lime, it could afford to lean on the oars for a while, I am not prepared to say, but I do know that for nearly twenty years operating technique, with the exception of a gradual change from gas producers to direct pulverized-coal firing, remained virtually unchanged from its beginning in the 1920's.

Heat Problems From the thermal standpoint we know that the ordinary rotary lime kiln utilizes the heat of the gases from about 2,500 degrees F. down to about 1,250 degrees F. so that about half of the heat of the gases goes up the stack. To lower the temperature of the exit gases, we might add 200 feet to the length of the rotary kiln, but we might add almost as much in radiation loss through the shell as we would recover from the stack gases. It is doubtful if the increase in efficiency would be sufficient to justify the increased installation cost or extra space required.

The rotary kiln is a poor form of heat exchanger; the hot gases ride to the top and the cold stone hugs the bottom. It is effective only as a means of getting large capacity with small stone and a uniform degree of burning. It makes an effective combustion chamber for a long flame and its suitability lies chiefly

W. R. Cliffe

in the high-temperature end of the burning operation. For efficient heat exchange, the gases should pass through the bed of stone, not just over it.

It was not until the late 1930's that rotary-kiln plants of really high efficiency put in their appearance. These plants have since more than justified the original claims made by the manufacturers and the hopes of the hearty souls who put up their money for them. With these it is practical to produce a controlled product with a fuel input equal to that of the best vertical-kiln practice and far superior to that of the rotary-lime-kiln vintage of the early 1920's.

Many rotary-lime-kiln operators are conscious of the fact that the time is not so far off when they will have to "do something." This open letter is written chiefly for their benefit.

It seems to be pretty generally accepted that the post-war period will witness little or no change in the cost of labor and the other items which enter into the production of a ton of rotary-kiln lime. As we gradually revert to a buyer's market, increasing competition will send sales costs soaring. Of course, in many instances there can be some relief in the lowering of extraction and preparation cost on the raw side by adopting modern practices, but the most important savings can be anticipated in the reduction of the fuel-input requirement and it is with this that I wish to treat.

Fuel Consumption In conversations among rotary-lime-kiln operators the matter of kiln length ranks high as a topic. It seems to be rather widely accepted that kiln length is the answer to the operator's prayer. Nothing could be farther from the truth. It is correct that kiln length offers opportunity to do things in the way of heat exchange, induced draft, etc., but it also carries other not-so-attractive responsibilities. Length in some instances has been carried to extremes. In others, it has been accompanied with little or no apparent reduction in the temperature of the exiting products of combustion. It is only when kiln length is coupled intelligently with instrumentation, control, heat-exchange media, insulation, heat recuperation, gas velocities, etc., that is can be justified.

Now please do not overlook the importance attached to this. The average kiln of the early period, fired with powered coal, is doing well to produce a ton of lime with 10,000.00 B.t.u.'s, whereas the properly-balanced rotary kiln of modern design will produce the same quantity of equal or better quality with 5,000,000 B.t.u.'s. Let us assume 1,000,000 B.t.u.'s to be worth 20 cents and the possible savings very quickly become apparent. This is the item we must look at, if the rotary-kiln operator is to produce profitably in a buyer's market.

But!, says the owner of the 1920 rotary-kiln, we have our initial investment to consider. Our kiln is so closely related to our raw preparation and storage equipment. The discharge end is fixed to our finished storage, processing and shipping facilities. Our plant has grown up around our short kiln. The terrain doesn't lend itself to extension of

the kiln. We can't disregard all these things.

That's right, you can't, but there are many things you can do. To keep abreast of the times always costs money, there is no getting around it. You simply have to decide which way you are going to spend it. If local conditions prevent the extension of the kilns, the next best thing is to utilize to the utmost what you have.

Being lime men you know there can be no fixed rules to follow. Most limestones vary widely in character. Some carry more impurities than others, some are hard while others are soft and friable. Some have a high porosity while the density of others makes its treatment more costly. Then there are color, moisture content, etc. Methods of blasting from the virgin state vary widely. Most limestone reacts differently to heat at elevated levels, which is a very important item for consideration. Quite naturally with all these variables there can be no set formula that will guide you to a better product at a modern fuel input level.

It is possible that you have been operating your kiln for so long that you accept many of its features as being right. A brief review of these may assist in crystallizing your thoughts to action.

Kiln Feed Rotary-kiln operators generally believe in clean, accurately-sized kiln feed, but how many of them practice it? Frankly, more operators feed run-of-the-crusher than sized stone. They won't admit in so many words that they do this, but, in the final analysis, that is what they do.

Another point to consider is the top size of the kiln feed. Because purchasers of fluxing lime set an arbitrary figure of 2½ inches, producers in those market areas pay more for fuel in order to burn a low-priced product. It sounds like "new deal" economy and it is. We have definitely proved that less fuel is required to calcine the uniformly smaller-sized particles. Limestone ⅛ inch in diameter, if fed in its proper size range, can be burned to a beautiful product with surprisingly less fuel. Rotary-kilning will utilize all the stone between ⅛ inch and 1¼ inches if broken down into five distinct sizes.

Draft Most of the kilns in the bracket covered by this letter operate under natural draft with little or no damper control. Of course, we like induced draft for its constancy, etc., but if the temperature of the exiting products of combustion is out of the practical range of a well-designed exhauster, then do the next best thing and give your kiln the benefit of controllable draft. While many operators strive to maintain ½ inch or more of minus pressure at their dust chamber, considerable benefit can often be obtained through a reduction of 2/10 inch and even lower. If chimney equipment has been designed for ½ inch or better, you are indeed fortunate in that sufficient leeway exists for damper control.

Of course, included under draft should come a thorough investigation of the air tightness of both hot and feed end seals.

Preheaters Much thought has been given in the past to stone preheaters in which the material being fed to the kiln is actually raised to important temperatures by the passage of hot otherwise waste gases through the stone void structure. Several are in operation and the procedure has much to commend it, but the high first cost and constant power drag of the exhauster should not be over-

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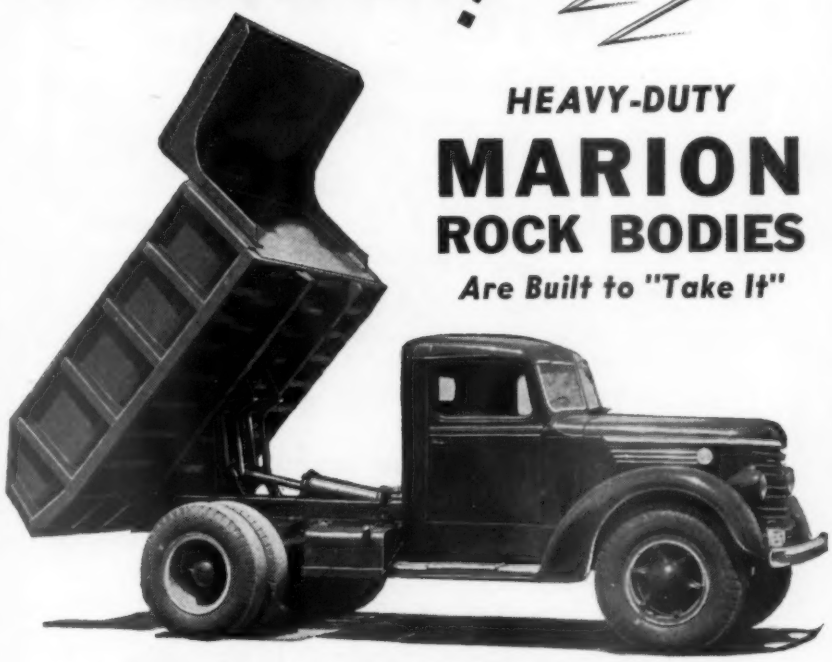

We know they must often undergo a world of pushing around under heavy shovels. That's why we build them to hold up perfectly under the most severe conditions.

The body pictured is equipped with a 2-inch oak cushion and ¼-inch steel wear-plate laid over a heavy floor and heavy steel-cab shield.

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looked. Furthermore, the cushioning influence of the hot gases passing through the stone bed detracts from the nicety of control which we now associate with induced-draft practices. However, it is entirely possible that a limestone preheater may contribute a great deal to the fuel reduction in short, older type kilns.

Kiln Speed Many years ago probably someone decided "we will rotate our kiln at such and such a rate" and this rate continues to be accepted as being correct. No phase of rotary kilning offers wider possibilities for multiple betterment than careful examination of the rotation rate. In recent years the trend has been toward relatively high rotation speeds. Now, these high speeds are all right if they have been revealed to be best on a basis of study of that particular local requirement, but so often this is not the case and we urge our readers to examine this matter very carefully. It is possible in your particular case that a very slow rotation rate with an exceptionally heavy kiln charge may be a factor in materially reducing the temperature of the exit gas.

Heat-resisting alloy steels as heat-exchange media are not usually associated with short-kiln practice. It is possible that an arrangement of refractories can be of assistance in increasing the time factor, subdividing the charge, breaking high-level gas stratification, actual heat transfer, etc. Very much promise lies in this field.

Insulation We know that existing insulating materials are far from perfect. We know *all* the headaches involved in its use, but we also know that it is absolutely correct procedure in most instances. Quite naturally the operator will say, "Why should I insulate my short kiln; why send more heat up the stack?" That is an all right question, but the insulating of a kiln does not mean that such dire results will follow. Read your insulating tables based on refractory-brick B.t.u. conductivity square feet/inch/hour/degree. Just because you reduce kiln-shell radiation losses does not mean that those B.t.u.'s saved go up the chimney. Adjustment can be made in increased capacity and decreased fuel input.

The insulating of a kiln may mean the changing of refractory types that have been standard with you for years, but that is all right; it can be done gradually and I assure you it will more than pay its way.

No single factor in the calcining of lime carries greater possibilities for waste in fuel and actual detriment of the product than overburning. It is an old, old story and I will not dwell on the evils involved other than to say, stop it as quickly as possible, save fuel and produce a better product.

From the initial installations, many of which still operate in the manner of their inception, it is apparent that the prime objective was to calcine the lime and then cool it as effectively as possible without regard to the value of its mechanical heat. This phase of the cycle offers abundant opportunity for a fuel saving and product betterment.

In conclusion, I realize full well that the present critical lime shortage is not conducive to thoughtful planning along the lines suggested. I know about the inferiority of available coal and the strain of pushing the maximum lime tonnage through the kiln. From long experience I am aware of the multiple load being

(*Continued on page* 106)

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DEWEY AND ALMY CHEMICAL COMPANY
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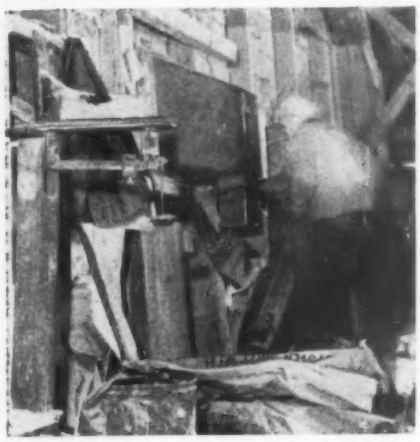
Western Lime *(from page 101)*

are chuted to their respective bins. The minus-40-mesh product of the revolving screen and "throughs" from the 3-deck screen are further sized by a 3- by 12-foot double-deck shaker screen, the finest product consisting of minus 60-mesh down to dust.

Six sizes of finished material are produced and stored—3 grades of "meal" and 3 of "shell." The meal, or finest product, consists mainly of soft, decomposed shell and the finest particles of the hard shell and is sold principally to milling companies for mixing with prepared animal feeds. Some goes to fertilizer makers as filler and a growing demand is being



Operator is here filling a bag on a scale at one of the 11 bin spouts.

Two of the multi-wall paper bags which are filled with 100 pounds of poultry grits and feed or fertilizer meal.

felt for its use as agricultural lime. The shell is hard and dense, still readily recognizable as such despite its great geological age, and is sold exclusively for poultry grits.

All the product is packed in 100-pound Bemis multi-wall paper bags. There are 11 bagging spouts emerging from the storage bins and the bags are filled manually and weighed on Fairbanks platform beam scales equipped with quick-reading over-and-under indicators. They are trucked by the weighers, after filling and tying, to an adjacent storage shed where flat-bed motor trucks are loaded and transport the bags down the winding mountain road to a railway siding at Santa Susana.

The plant has been operated continuously by the Western Lime Products Company for the last eight years but the deposit had been worked sporadically ever since 1922. Production is at the rate of about 560 tons, or 11,200 bags, of finished material per week. About 80 bags, or 4 tons, of shell and meal is carried down the mountain by a truck. On the return trip, these trucks bring up bales of empty bags, fuel oil for the drier, and other needed equipment and supplies. The climate is mild and operations are carried on the year around.

A power line of the Southern California Edison Company supplies 220-volt current for the electric motors in the plant and quarry.

B. J. Winslow is president of the company, and J. C. Gillibrand is the general superintendent of the plant.

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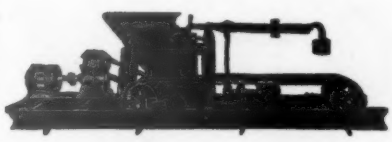

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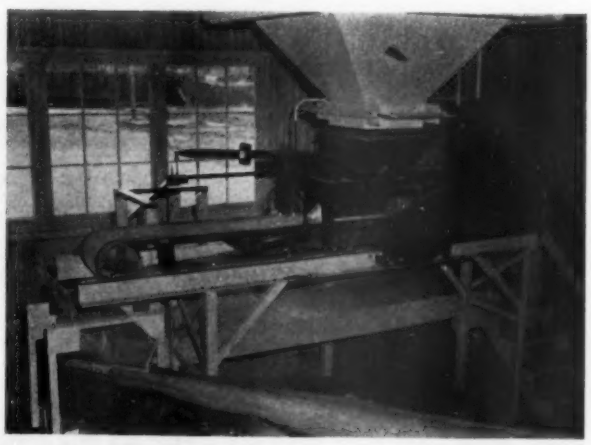
Available with remote control recording and operating devices, and total weight recorders.



One of several SCHAFFER Poidometers in the Ludington, Mich., plant of Dow Chemical Co. Poidometer is weighing and feeding dolomite to rotary kilns.

Write for Catalog No. 5

SCHAFFER POIDOMETER CO., 2828 Smallman Ave., Pittsburgh 22, Pa.

Open Letter (*from page 104*)
bring a fresh unbiased viewpoint. I want also to make another point clear, that the attainment of the ultimate in rotary-lime-kiln practice, does not result from any one all-embracing step, but rather from a multiplicity of small considerations which combine to put that operation in a state of efficient balance.

W. R. CLIFFE.

Senator Urges Cooperation to Aid Construction

Federal, state and local governments should coöperate with and give the construction industry every aid in preparing for quick resumption of high levels of construction activity immediately after sharp cutbacks in war production, Senator James E. Murray of Montana, chairman of the Senate Special Committee on Small Business, stated March 11, in announcing the developing plans of the committee in the study of construction - industry problems.

This industry offers more widespread opportunity for expansion of small business than any other non-agricultural industry, Senator Murray said, recalling that in the past, the construction industry has, directly and indirectly, provided from 6,000,000 to 9,000,000 jobs annually. War-time restrictions on construction, however, have reduced the operations of the industry to the lowest level since 1933. The committee, therefore, is undertaking a study of the industry with particular reference to the part which small business can play in speeding the end of the war, in the smooth transition from war to peace, and in expanding opportunities for post-war employment.

Said the Senator: "The industry is operating at such low levels that purposeful action must be taken now to enable it to recover lost ground as quickly as possible once Germany and Japan are defeated. It has normally been subject to violent fluctuations in the annual volume of work done. In the best interests of the nation as a whole, seasonal and cyclical swings in construction activity and, consequently, employment, should be stabilized at the highest level of output without fostering restraints upon free competition. Intensive examination of basic problems will be undertaken by means of studies and public hearings in order to determine what steps by the government as well as by industry and labor are required for stabilization of construction at high levels of activity providing at all times an optimum share of full employment for all people willing and able to work."

The committee will receive help from individuals and organizations comprising the construction industry, organized labor, and other interested groups. Working under the direction of Dewey Anderson, executive secretary to the committee, Frank Piovia has been selected as consultant to coördinate the studies. Other specialists in the construction field from WPB and non-government agencies will coöperate in consultation in the work of the committee.

Louisiana Shell Plant

With much fanfare, a plant in which lime from Louisiana shells will be ground for soil enrichment purposes was dedicated Jan. 18 in Slidell, Louisiana, by former Gov. Sam H. Jones.

The Bogue Chitto-Pearl River Soil Conservation District established the Slidell lime plant and is operating it. During the Jones administration, Louisiana, through its State Board of Liquidation, appropriated $20,000, which the former Governor said was "one of the wisest investments the state ever made." The federal government appropriated $10,000 worth of equipment.

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THE progressive agricultural limestone producer is the one who *first* reduces his quarried stone in a Jaw Crusher. And you can be sure of maximum reduction efficiency with a Rogers Jaw Crusher.

Each Rogers crusher is individually designed and correctly proportioned. Bearing sizes used are from two to three sizes larger than normally used. Shaft diameters are correspondingly oversize. Other parts are made of the best materials available, which contributes toward the durability and reliability of Rogers Jaw Crushers.

The 15" x 36" Anti-Friction Bearing Jaw Crusher shown here is typical of the high rate of reduction to be had in Rogers Jaw Crushers. It produces from 74 tons per hr. of 2½" stone to 160 tons per hr. of 6" stone on 60 to 75 hp.

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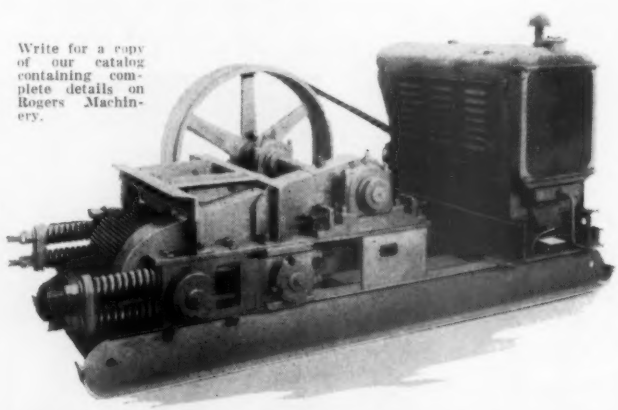

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A Tribute to the Superintendent (Anonymous)

One of PIT AND QUARRY's readers has contributed the following comments on the role of the superintendent in the average nonmetallic-mineral plant. They are published here because of their interest not only to other superintendents but to modern executives as well. In the hurry and worries of management the contributions of the superintendent toward company success are sometimes forgotten or lightly appraised. These comments will serve to refresh the memories of some who may not always have been aware of the responsibilities that rest heavily on the minds and consciences of those responsible for production.

The Superintendent The Most Important Man Around the Plant

Who is the most important man around the plant? Of course everyone knows there is just one answer: the superintendent! If there should be any doubt about it, just try to get along without him for a little while.

The chief can go away for weeks at a time—to Florida, let us say—and still the earnings will go on piling up just the same. The other officers can play golf or attend a ball game two or three afternoons a week, with no visible detriment to the interests of the organization, and the non-coms and privates of the company can attend as many ball games as their consciences will allow, and still there will be the wherewithal to fill their pay envelopes Saturday noon.

But the superintendent! Oh, boy! Answer up right, Jim, and tell us something. How many baseball games have you seen in the last three years? How often have you been to the movies with your family? How many times has the Mrs. remonstrated with you for not getting home to supper on time?

And then, remember that time, Jim, when your sister came to visit you overnight, and you looked forward to having such a pleasant time together? But that very afternoon the crusher broke down, and a new piece had to be put in, and your sister got out without seeing you, and two of us worked on that thing until past midnight, so that the plant could be ready for operation next day.

"We haven't forgotten that time, either, when little Georgie was so ill, just when we were rushing out that big order of hydrated lime for the paper mills, for war efforts. You stuck by the job, Jim, when your heart was in the little cottage up the road toward the company village, and you kept production at its peak, even when you were often looking to see if your son Jerry might be coming over the hill with the news from home."

So it has gone all the many years. The superintendent, whatever his name, has been the responsible man —his time fully—devoted to production without even a thought of the clock—planning the work in advance, keeping men and machines at their best, quick to anticipate trouble and prevent it, resourceful in emergency, getting out to-day's quota to-day and going it a little better if possible. And, with it all, keeping an eye to the future so that the plant may keep pace with the development of the industry and may not be the last to lay the old aside.

The Superintendent — the man around the place—is the man who is making your money for you, Mr. Operator. He is the man your banker keeps his eye on when you ask him for a loan. Your big customers want to be assured that he is to stay on the job before making their contracts. They know his worth and the things he represents.

Who's the superintendent? He's the man who does the thing that has to be done!

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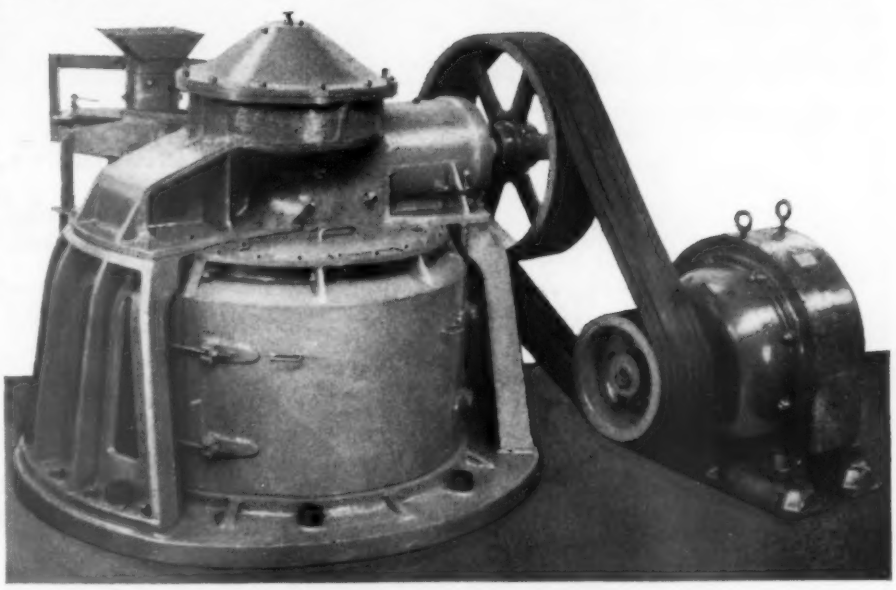

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* Exceptionally low maintenance and power cost
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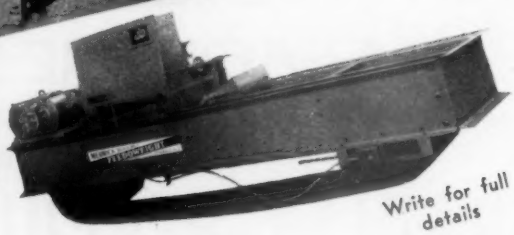
WEIGHTOMETER insures commercially accurate continuous weight records, at very low operating costs.

FEEDOWEIGHT

. . . is recommended for feeding limestone to kiln at required tonnage rate for most efficient kiln operation. Weight totalizer gives continuous record of tonnage fed.



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MERRICK SCALE MFG. CO. 188 AUTUMN STREET PASSAIC, NEW JERSEY

WPB Talc Consumption Estimates for 1945 Rise

According to the War Production Board, consumption of talc during 1945 will total 340,000 tons, representing an approximate 20,000-ton increase over 1944, it was estimated at a recent meeting of the Talc Industry Advisory Committee. Talc consumption in 1944, in turn, represented a 20,000-ton increase over 1943.

The continuing uptrend in talc demand reflected increased consumption over a broad list of end uses, including paint, roofing, paper, rubber and insecticides, rather than a major increase in any one end product, said the W.P.B.

Production of talc dropped to about 320,000 tons in 1944, which was reflected in a drop in average inventories to about a six-week supply. This trend prompted the recent issuance of amended Order M-239, which channeled critical grades of talc into the most essential war needs, such as camouflage paint for the Navy and United States Maritime Commission.

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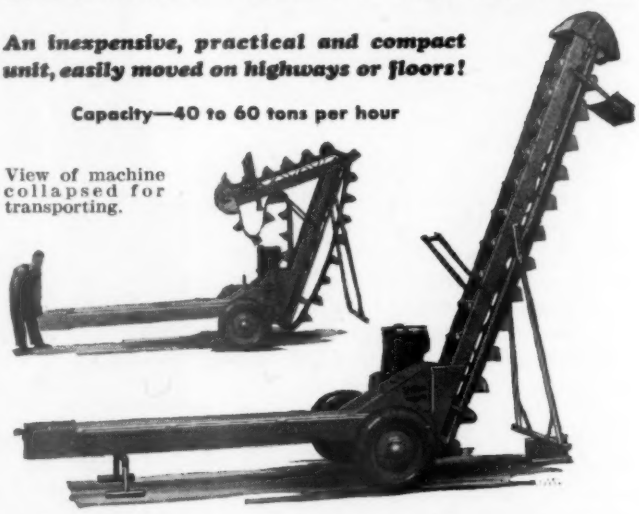

Our Model L (Bucket Type) Car Unloader **requires no pit. Compact and easily transported** — either as a unit or disassembled. Has the advantage of requiring no pit and will take the material from across the **entire car — either above or under the rails.** Ideal for portable unloading, handling lime, stoker coal and other non-abrasive materials. **Ball and roller bearings throughout.** Either electric or motor driven. **Lengths to suit your requirements.**

Manufacturers of the famous "Hi-Speed" line of Self-Unloading Equipment.

Model K and I, Chain Conveyor Type	Special Low Boy Tractor Spreader
Model H and D, Chain Conveyor Type	Model F, Flat Bed Type
Model E, Belt Conveyor Type	Model J, Transfer Type
Model C, Cinder and Chip Spreader	Model L, Car Unloader
Model N, Dump Body LIME Spreader	Model M, Car Unloader

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HERRINGBONE GEARS

For Heavy Duty... Continuous Service

Continuous Tooth Herringbone Gears are the most efficient type of gears known for transmitting heavy loads at high speeds—where the service is continuous—where shock and vibration are constantly encountered—where great peripheral speeds must be met—where high reduction ratios are necessary in a single gear train. Greater strength; increased bearing surface and extra load carrying capacity result because of the continuous tooth design that allows more teeth in contact and a continuity of tooth action.

Our Sykes gear cutting machines can produce continuous Tooth Herringbone Gears up to 60 inches in diameter and 18 inch face of any pitch or material.

Send for a copy of our Gear Catalog . . . on your business letterhead, please.

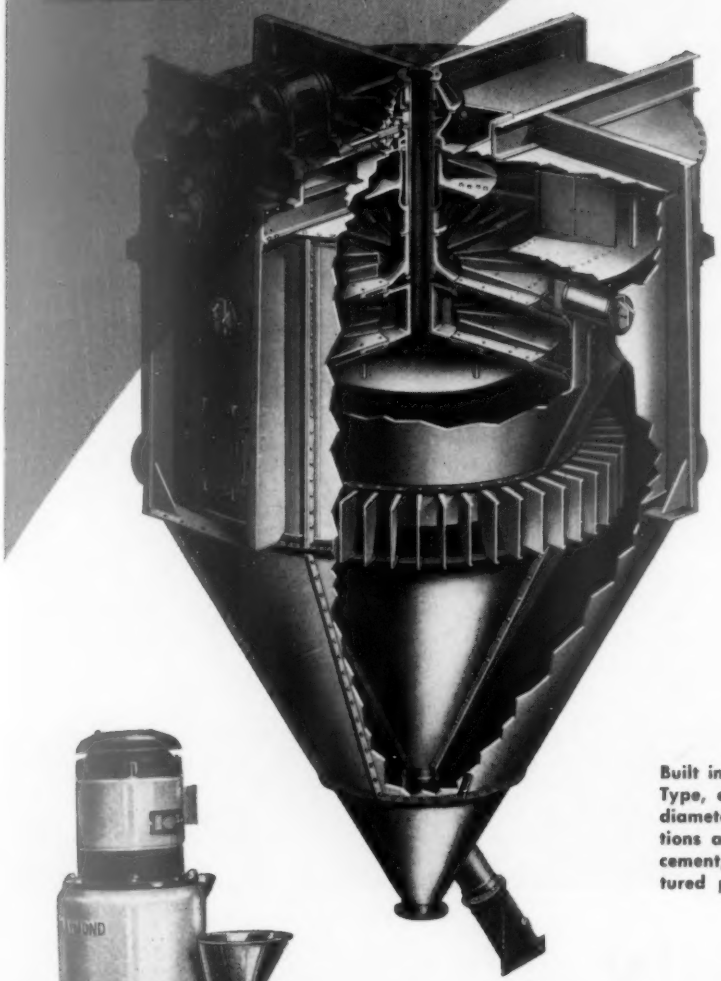
Philadelphia

GEAR WORKS INCORPORATED

ESSIE AVE. AND G ST., PHILADELPHIA 34, PA. NEW YORK • PITTSBURGH • CHICAGO

Industrial Gears and Speed Reducers
LimiTorque Valve Controls

CLASSIFYING HYDRATED LIME



The Raymond whizzer type Mechanical Air Separator is specially adapted for classifying hydrated lime, as the revolving whizzer blades tend to break up the soft lumps, thus permitting closer separation of the fines and insuring more positive rejection of the oversize.

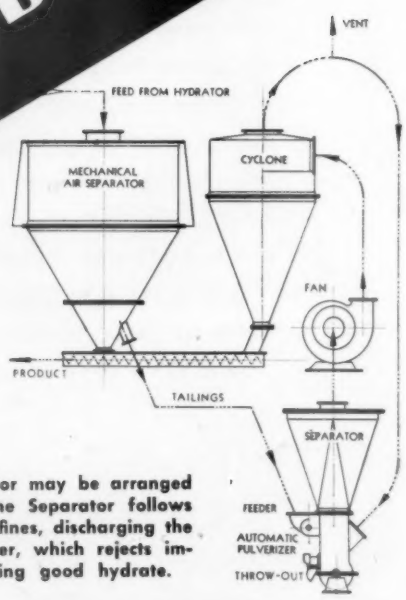
The use of the double whizzer with the slide damper control makes it possible to regulate the fineness, so as to produce either the coarser mason's lime or the superfine chemical hydrate, testing 99.5% through 325-mesh.

The use of the Mechanical Air Separator in combination with the Automatic Pulverizer, as shown in the diagram below, provides an efficient method of making an extremely fine and uniform finished material at record low cost.

Raymond Laboratory Separator for small scale test work as in handling a few pounds at a time, up to 50 or 100 pound lots, to determine the efficiency of separation.

Built in Single Whizzer or Double Whizzer Type, and in sizes from 2' 6" to 18' 0" diameter, for a wide range of applications and capacities. For classifying lime, cement, gypsum, chemicals and manufactured products.

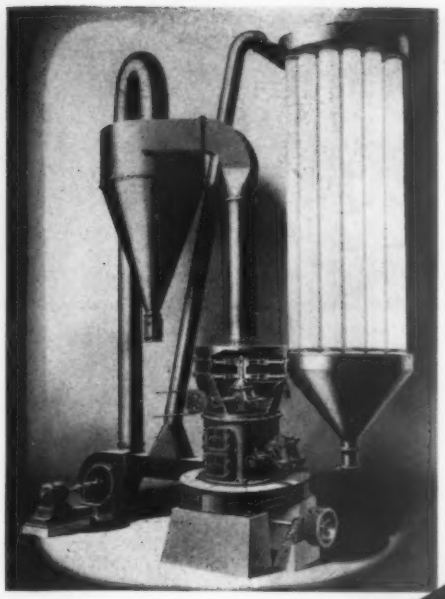
Make finer LIME PRODUCTS



Flow Sheet, showing how Separator may be arranged with an Automatic Pulverizer. The Separator follows the hydrator to remove available fines, discharging the tailings to the Throw-out Pulverizer, which rejects impurities and recovers the remaining good hydrate.

RAYMOND PULVERIZER DIVISION

1321 North Branch Street Chicago 22, Illinois



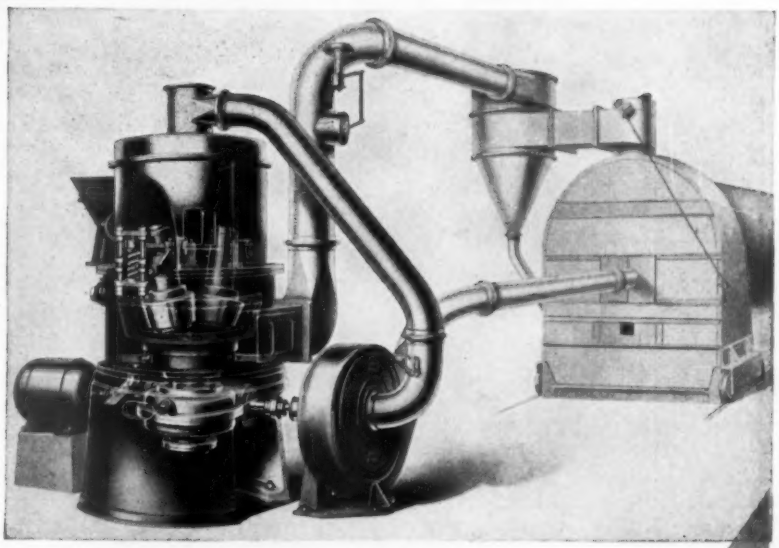
PULVERIZING LIMESTONE

For heavy-duty grinding . . . requiring big capacities at low cost per ton . . . and long, steady service, use the Raymond High Side Roller Mill. Built with double whizzer separator for wide range fineness control. Throw-out attachment optional, for removing impurities and refining the product.

Highly efficient for grinding burnt lime, dolomite, agstone and limestone fillers

with modern RAYMOND UNITS

DIRECT-FIRING LIME KILNS



THE RAYMOND AUTOMATIC PULVERIZER

Equipped with whizzer separator . . . disintegrates and classifies the material . . . rejects hard particles or impurities, and delivers a uniform finished product.

RAYMOND BOWL MILL

The modern firing unit that insures maximum kiln efficiency and minimum maintenance and operating cost. The Bowl Mill handles any grade or moisture coal and "dries in the mill."

Maintains uniform grind . . . provides easy control . . . quiet, vibrationless operation. Capable of 24-hour operation, month after month, without shutdowns.

Thermostatic control . . . lubrication and adjustments made outside of mill while in operation . . . high availability . . . wide range capacity.

Write for Descriptive Catalogs

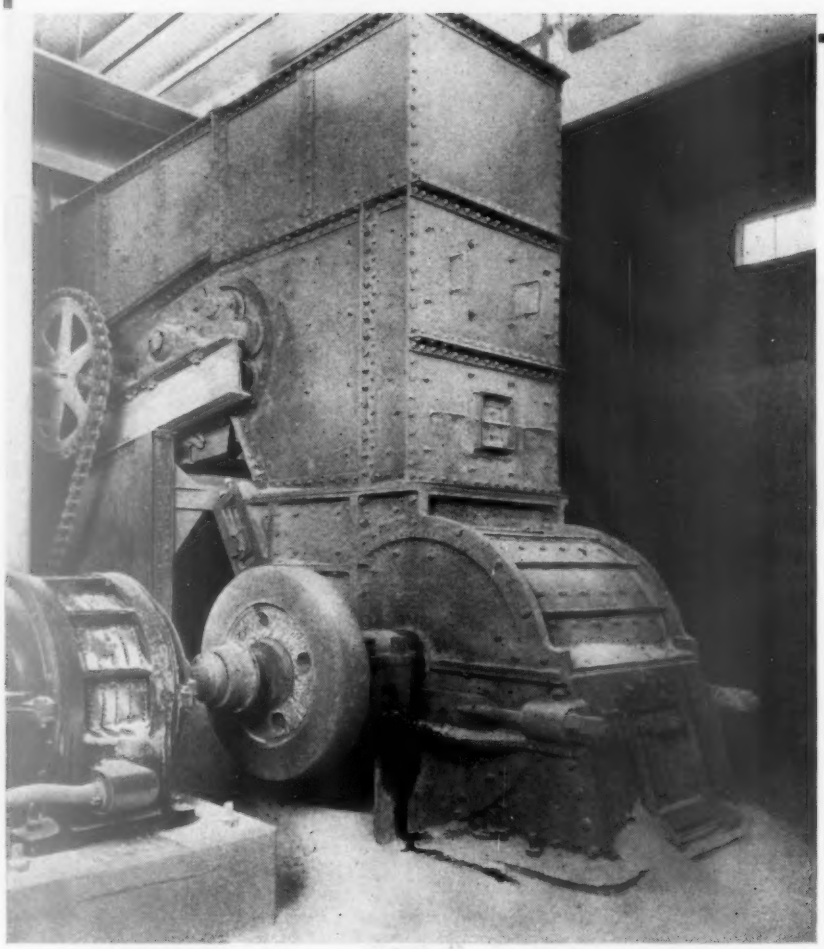
Combustion Engineering Co., Inc.

Sales Offices in Principal Cities—Canada: Combustion Engineering Corp., Ltd., Montreal

BOWL MILL

51,000,000 TONS OF AGSTONE NEEDED ANNUALLY

MEANS LARGE CAPACITY EQUIPMENT



DIXIE
NON-CLOG
HAMMERMILLS

Will Assure Large Capacity from Quarry Size Stone. Guaranteed Not to Clog.

This powerful Dixie Non-Clog Hammermill crushes feed from a 2½ cu. yd. shovel at the rate of 250 tons per hour. Its performance is typical of the greater capacity you can get by using Dixie Hammermills.

Dixie Hammermills are made in 14 sizes with capacities ranging from 10 to 100 tons per hour. They offer such outstanding features of advanced hammermill design as the Non-Clog moveable breaker plate and the adjustable feed end.

Write for data.

DIXIE MACHINERY MFG. COMPANY

4121 GOODFELLOW BLVD. ST. LOUIS, MO.

We Call Our LINK-BELT SPEEDER "The Machine that's Never Down!"

On the go 20 hours per day for over two years, this LS Eighty-five has won unstinted praise from its operator. Not only has it maintained a higher average loading, but it has been in tip-top shape without a moment's time out for repairs or maintenance.

Performance of this kind wins friends,—and makes money for contractors the country over.

GET A BIG BITE with a LINK-BELT SPEEDER

For Prompt, Efficient, Convenient Sales and Service There Is a Link-Belt Speeder Distributor Located Near You

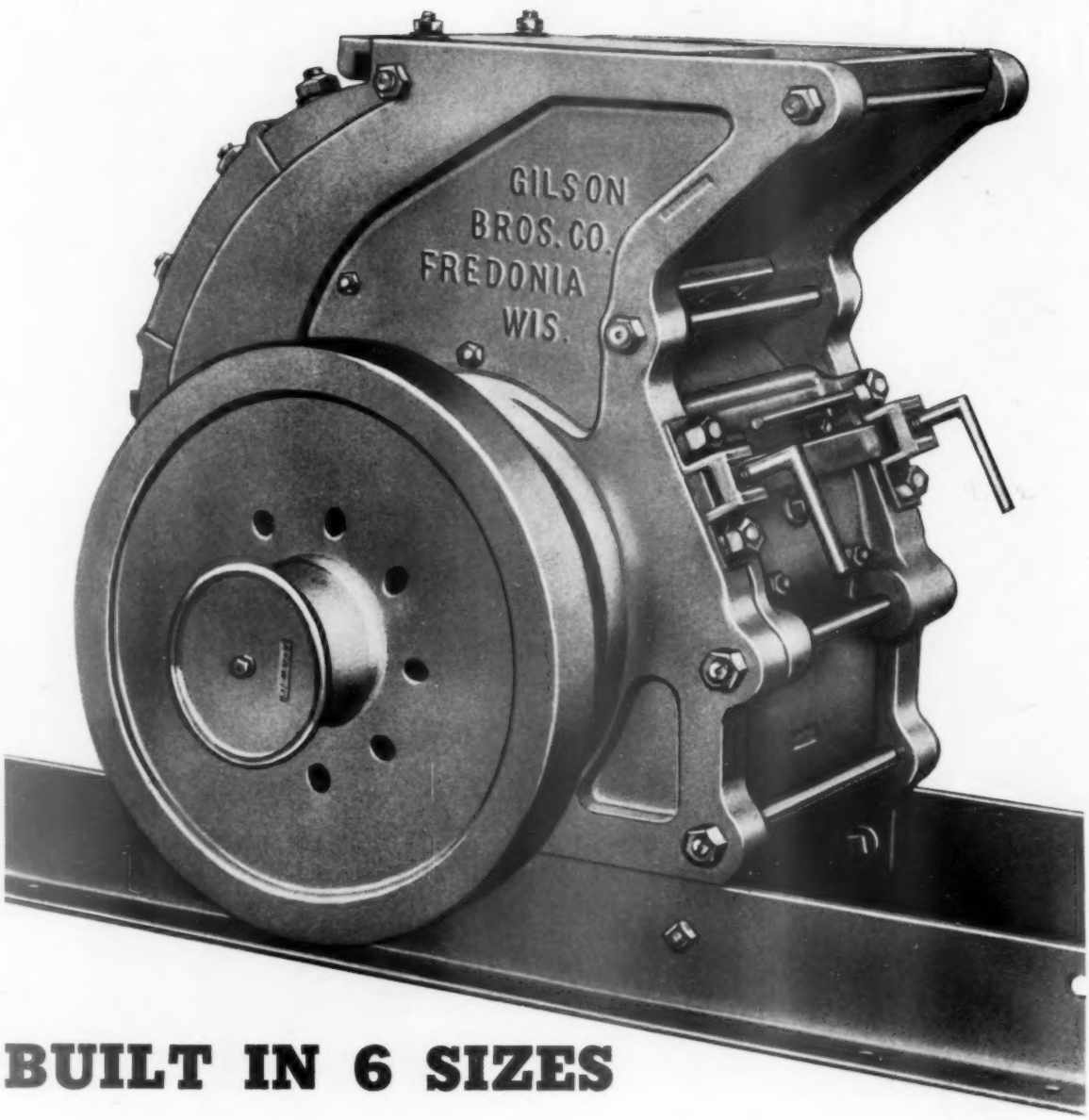
9054

LINK-BELT SPEEDER

Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO-9, ILL.
(A DIVISION OF LINK-BELT COMPANY)

ALWAYS IN THE LIMELIGHT



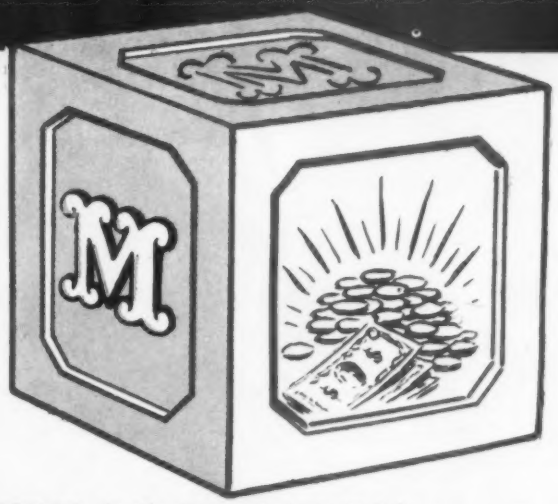
BUILT IN 6 SIZES

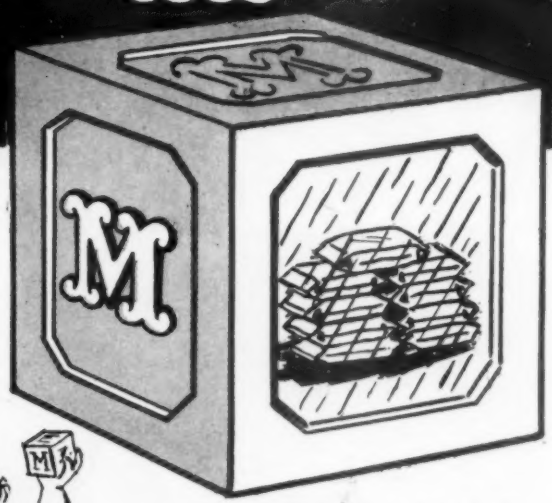
GILSON BROS. CO.

PULVERIZERS
CONCRETE-MIXERS

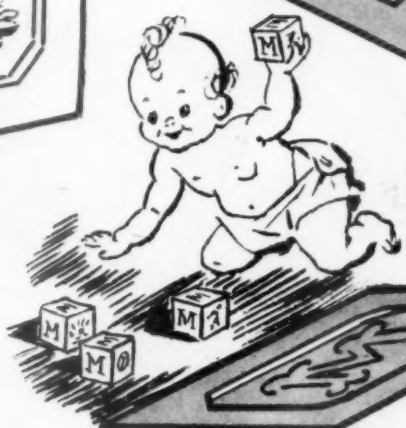
FREDONIA, WIS.

Can you name the four M's... that Multiwalls save?





1. MONEY. Aside from their initial low cost, St. Regis Multiwall paper bags save M-O-N-E-Y for other important reasons. These bags prevent losses due to siftage; retention, and infestation. They help keep storage rooms clean and they reduce labor and handling costs.



2. MATERIALS. Multiwalls save materials. These bags are tight, sturdy and moisture-resistant. They protect products from damaging dampness and rough handling in transit and in storage.

3. MINUTES are also saved by using Multiwall Paper Bags. These bags are quickly filled and quickly loaded . . . quickly and easily opened, too.

4. MANPOWER is perhaps the most important saving which Multiwall bags and bag-packing machines offer today. St. Regis bag-packing systems—including the sewn pack, valve pack and tied pack — actually enable more work to be accomplished with less men.

MULTIPLY PROTECTION • MULTIPLY SALEABILITY

ST. REGIS PAPER COMPANY

TAGGART CORPORATION

NEW YORK 17: 230 Park Ave. CHICAGO 1: 230 No. Michigan Ave.
BALTIMORE 2: 2601 O'Sullivan Bldg. SAN FRANCISCO 4: 1 Montgomery St.

The St. Regis Paper Company offers you a complete packaging service. Our packaging engineers will be glad to cooperate with you in the development of a packaging system which will be custom-made to fit your individual requirements.

For complete information call your nearest St. Regis office today.

IN CANADA:
St. Regis Paper Co. (Can.) Ltd.
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Boston, Mass. Birmingham, Ala. Dallas, Tex.
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Seattle, Wash. Nazareth, Pa. Toledo, Ohio

In the Limelight

..... When it comes to LIME PRODUCTION!

HIGH CAPACITY PRODUCTION . . . FINER MATERIAL . . . LONG SERVICE . . . EFFICIENT OPERATION . . . and the ABILITY TO turn out that extra truckload are the main reasons why Lippmann Limestone Pulverizers are the pacesetters in their field. . . . Years of this type of performance have established a reputation for Lippmann Limestone Pulverizers that is beyond the comprehension of those who have never seen them at work . . . in short, we are only telling you that Lippmann Limestone Pulverizers will deliver . . . and will deliver consistently . . . pulverized limestone in quantities huge enough to help meet the requirements of our National Agricultural Lime Program . . . a program you can become a vital part of with Lippmann equipment.

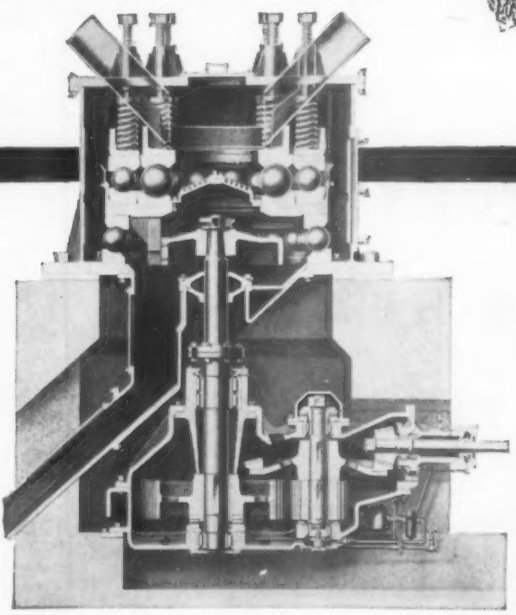
. . . Write or call us today for further information, and let us show you how you can put your business in the LIMElight.

LIPPMANN LIMESTONE PULVERIZER

LIPPMANN ENGINEERING WORKS MILWAUKEE 14 WISCONSIN

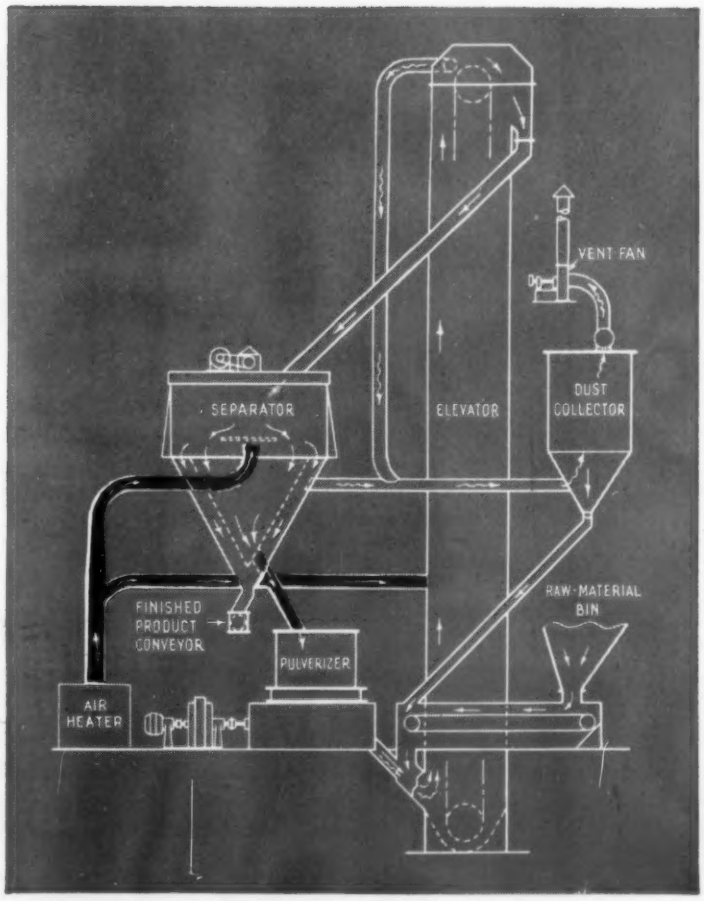
Also Manufacturers of Complete Lime Plants, Jaw Crushers, Roll Crushers, Vibrating Screens, Conveyors and Bins.

DRYING AND GRINDING in ONE operation...with the B&W Closed-Circuit System



- Eliminates separate drying equipment
- Reduces cost of kiln feed
- Substantial circulating load assures a well-blended product

THE BALL-BEARING PRINCIPLE OF GRINDING MAKES THESE ADVANTAGES POSSIBLE



THE BABCOCK & WILCOX CO.

85 LIBERTY STREET, NEW YORK 6, N. Y.

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It's in the BAG

☆ AND THE RIGHT BAG

☆ IS A JAITE HEAVY

☆ DUTY MULTI-WALL

☆ PAPER BAG

Jaite "Multi-Wall" Paper Bags serve at home and abroad, giving "Dependable Protection" to any product packed within their stout walls, carrying The Goods for Victory.

Jaite Bags are made out of Super-Quality "Multi-Wall" Kraft Paper, including Moisture-Proof Sheets when necessary. In Sewn' or Pasted Types.

THE JAITE COMPANY

MANUFACTURERS OF PAPER AND PAPER BAGS

JAITE, OHIO

SINCE 1905

Take This Quick Trip through a MULTICLONE dust collector

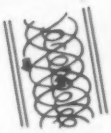
. . . see why it is more compact, more efficient, simpler to install!

FEATURE #1
In the MULTICLONE only a simple inlet is required which is easier to install, easier to insulate and far more compact than conventional multiple manifold arrangements.

FEATURE #2
Incoming gas is divided into many small portions which are individually processed. Cleaning gas in many small units assures more thorough dust recovery than treating in a few large chambers.

FEATURE #3
Gas enters each tube from the top, eliminating complicated multiple manifold of side-entry cyclones. Exclusive MULTICLONE vane then divides gas into eight gas streams, uniformly spaced around circumference of collecting tube. Assures absolutely uniform distribution of gas for maximum cleaning efficiency!

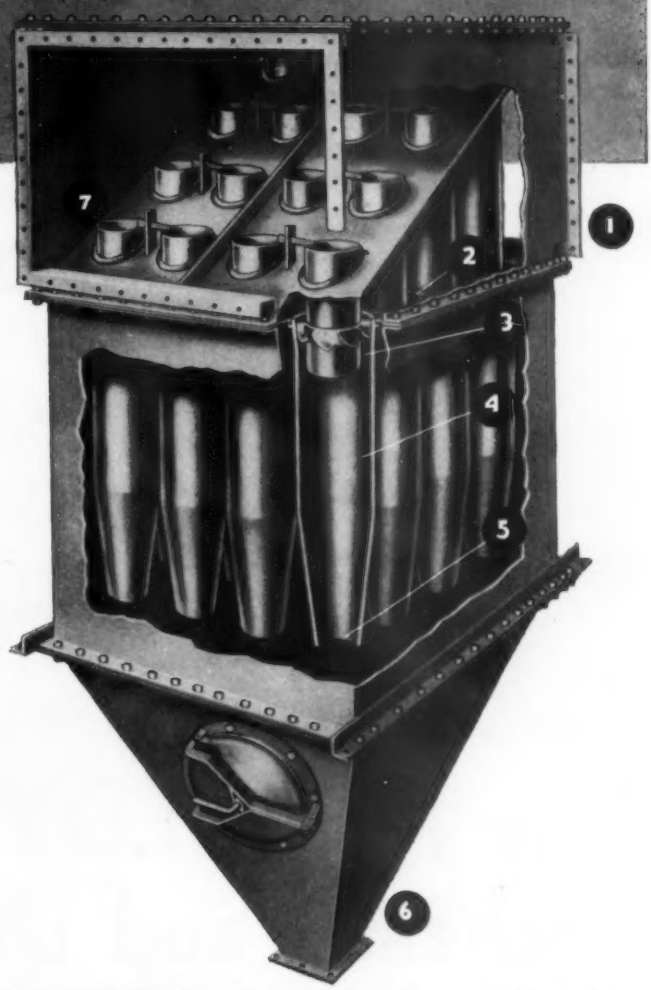
FEATURE #4
Gas is centrifugally cleaned in multiple small-diameter collector tubes. Because of sharper radius of small diameter tubes, higher centrifugal forces are generated to throw out extremely fine as well as coarser dust particles. Result—more complete recovery of all dust!



FEATURE #5
Dust is discharged from collector tubes as quickly as separated. No screens to become clogged or choke gas flow. Draft loss remains uniformly low at all times . . . and there are no filters to clean, replace or maintain!

FEATURE #6
Dust recovered from an entire bank of tubes is collected from a single discharge hopper. Much simpler and easier to service than multiple hoppers of conventional cyclone systems.

FEATURE #7
Cleaned gas leaves the MULTICLONE from a single common outlet header which further simplifies duct work and installation as well as conserving space.



The MULTICLONE is the result of over 37 years concentrated research and development in the recovery of suspended materials from gases, beginning with the first commercial application of COTTRELL Electrical Precipitation. It embodies so many *exclusive* advantages—advantages that increase recovery efficiency, reduce installation costs, save valuable plant space and simplify maintenance—that you should get the complete MULTICLONE story before you install *any* type of recovery equipment. Send for this booklet . . .

WESTERN
Precipitation
CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Office: 1015 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
CHRYSLER BLDG., NEW YORK 17 • 140 S. DEARBORN ST., CHICAGO 3
HOBART BUILDING • SAN FRANCISCO 4, CALIFORNIA
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

HIGH *Efficiency Equipment* for Modern Lime Plants

The KENNEDY Stone Preheater and Deheater

. . . combines the high quality production of a rotary kiln with the operating economy of a vertical kiln.

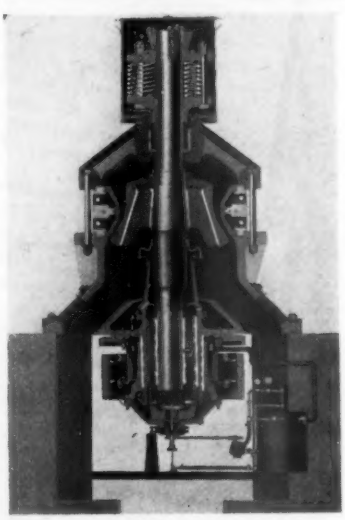
Fired by the KENNEDY Air-Swept Direct Firing Tube Mill System, this unit shows in actual operation a 20% increase in capacity with fuel saving up to 40% over the ordinary lime kiln not equipped with preheater and soaking pit.

Partial calcining of the material takes place in the Preheater, thus reducing kiln wear and permitting shorter kiln lengths.

Overburning or underburning are eliminated in KENNEDY-equipped kilns, which acquire a protective internal glaze that lowers power requirements and slows kiln ring formation.

Progressive lime plant operators who employ the KENNEDY System are assured of an advantageous position in meeting today's emergency requirements, or economical peace-time production.

Representatives in all principal cities in the United States and foreign countries including Ejido 7-503, Mexico, D. F.



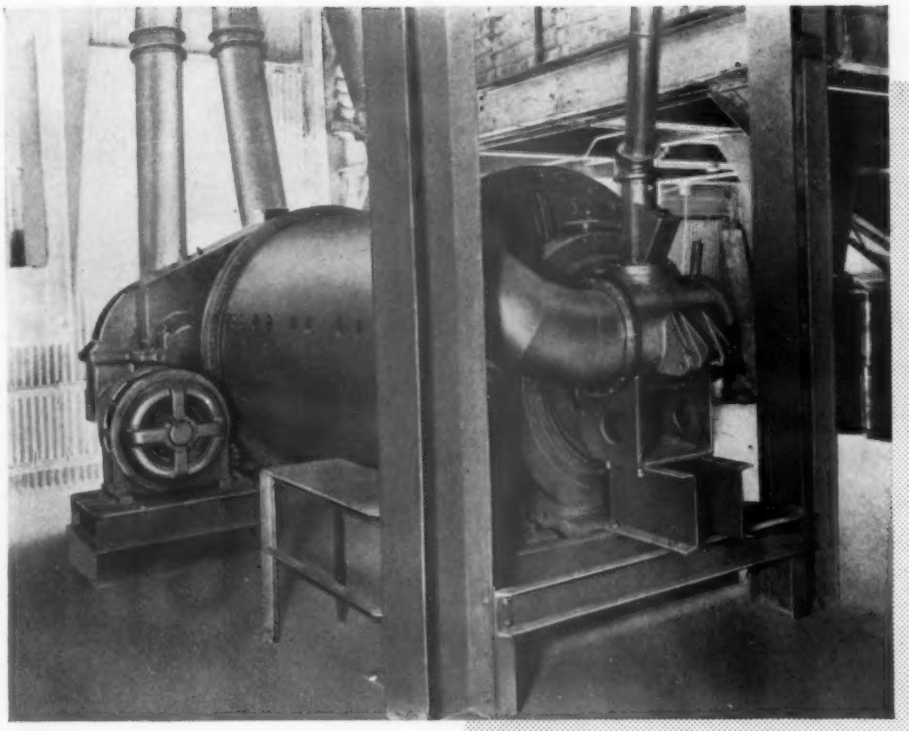
KVS Ball Bearing Crusher
. . . low head type, for fine crushing. Gearless. Power-saving, synchronous motor built-in pulley. High capacity with reversible concaves giving double the wear on the concaves and mantle as compared with any other crusher.

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

Kennedy-Van Saun

AIR SWEPT

TUBE MILL



produces

7

TONS PER HOUR

with a feed of —¾" limestone and dust.

The KENNEDY Air Swept Tube Mill

. . . provides a high-capacity, low-cost grinding unit for accurately sized agricultural limestone.

The product is collected in three cyclones, as shown below:

(1) 5 Tons Per Hour, 80% —200 Mesh
(2) +1 Ton Per Hour, 92% —200 Mesh
(3) 400 Lbs. Per Hour, 99.8%—325 Mesh

The KENNEDY Air Swept Direct Firing Tube Mill System combines simplicity and economy in firing pulverized coal in lime, cement, gypsum or other plants, requiring extreme, steady heat.

KENNEDY Products include a complete line of equipment for burning, crushing, pulverizing, sand washing, and screening.

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KVS Vibrating Screen

. . . featuring low installation and maintenance costs. Screening efficiency approximately 95%. Two types, several sizes.

ARMY E NAVY

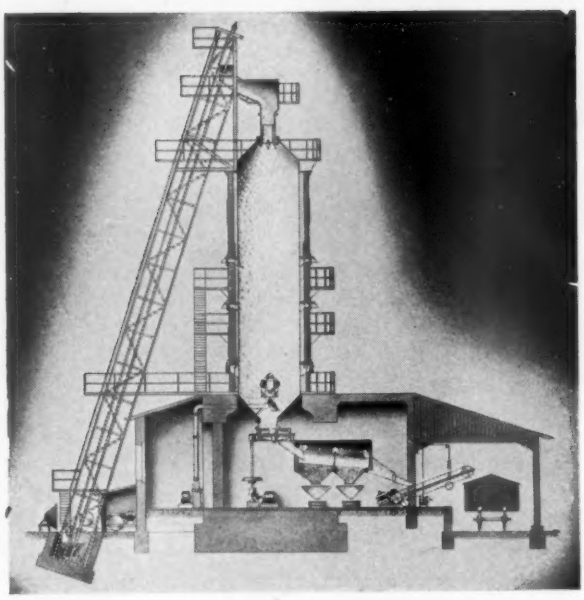
2 PARK AVENUE • NEW YORK 16, N. Y. FACTORY: DANVILLE, PA.

LIME HYDRATE PLANTS—

Stop that loss . . Save lime fines

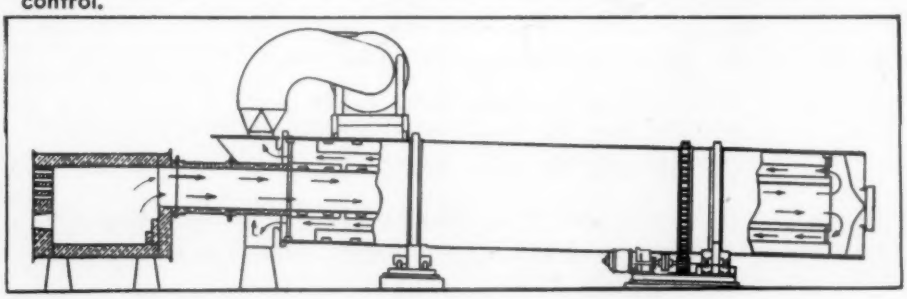
LIME Production for Profit

KUNTZ GRAVITY SYSTEM OF LIME HYDRATION — Provides absolute control of the hydration process in a single unit. Saves up to $1.50 per ton because patented dust control stops all loss of lime fines. Heat of hydration, often wasted, is used to heat water applied to hydrator. The only automatic system of one-man operation giving 100% control of quality and uniformity. Batch or continuous method. Can be applied to any type of hydrate plant.



YORK DOUBLE SHELL DRYER (Lower Right) — High thermal efficiency and the resulting economy of operation of the York Dryer is unsurpassed. Double shell allows hot gases to dry and pre-heat the stone by radiation. Gases absorb moisture in inner flue, completing the drying process. Result: high fuel efficiency with resultant fuel economy.

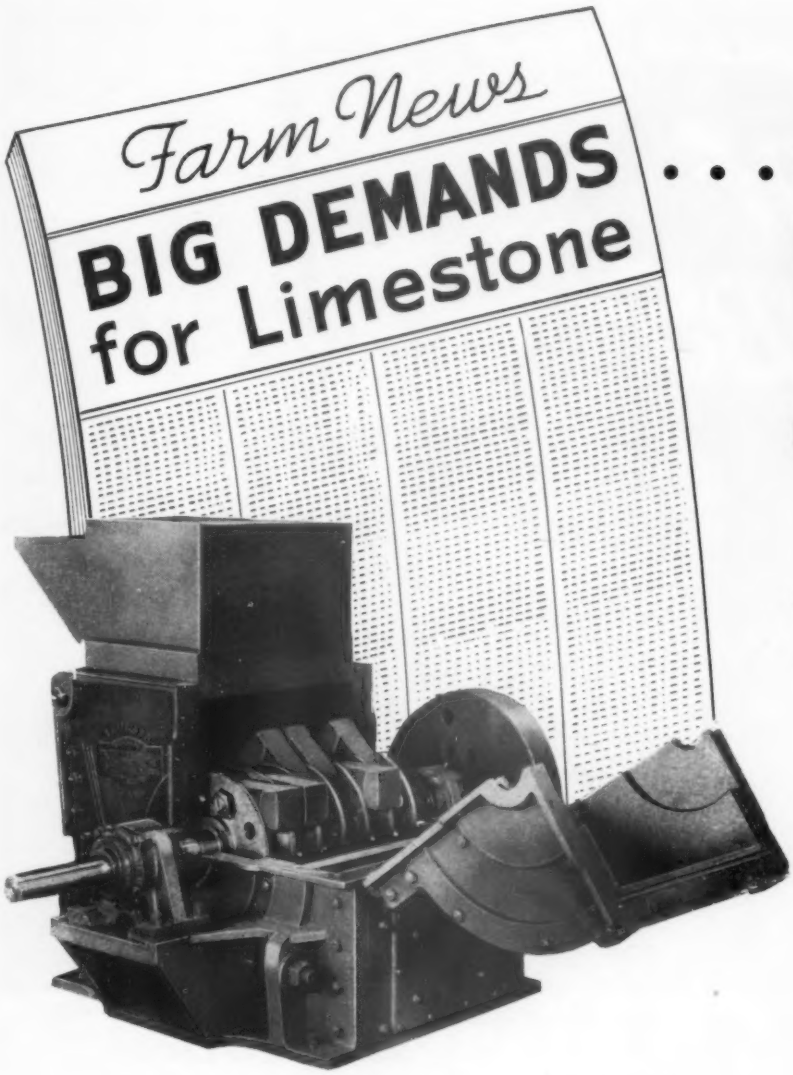
YORK-KUNTZ AUTOMATIC VERTICAL LIME KILN (Above)—Here's an automatic kiln that eliminates crushing and assures continuous control. Result: a uniform burn that reaches the absolute peak of fuel efficiency. Features: either mixed feed, coal or gas firing; continuous discharge and continuous feed; adjustable distribution; center load support; center combustion control.



OTHER PRODUCTS — LIME PLANTS COMPLETE - HYDRATORS - SHAFT KILNS
ROTARY KILNS - DRYING MACHINERY - TANKS - BINS - GREY IRON CASTINGS
SUGAR MACHINERY - SPECIAL MACHINERY FROM ENGINEER'S DESIGNS

LIME & HYDRATE PLANTS CO.

York, Pennsylvania



Open view of Williams "Slugger" Crusher showing heavy duty hammers, liners and discs. The "Slugger" reduces ONE MAN size stone to 1¼", ¾" or agstone in ONE OPERATION.

. . . meet 'em with

WILLIAMS Crushers

•

THEY'RE "HEADLINERS"

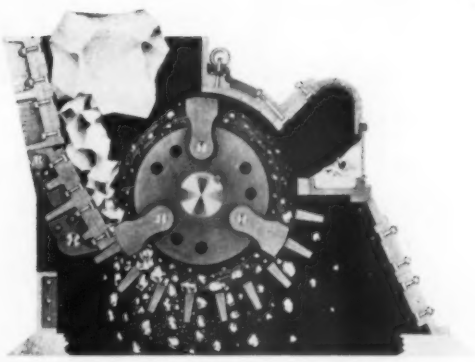
for large-scale production of

AGSTONE
CONCRETE
ROAD STONE

WILLIAMS Hammermills are "Good News" for crushed stone producers who must keep pace with the expanding needs of farmer, contractor, and road builder.

WILLIAMS Crushers combine simplicity in design with extra heavy-duty construction, insuring continuous, high-capacity service and minimum operating costs.

WILLIAMS furnishes a size for every job—and every crushing job does *better* with a WILLIAMS!



Sectional view showing operation of the Williams Hammer Principle of crushing.

The Williams Patent Crusher and Pulverizer Co.

802 ST. LOUIS AVE. ST. LOUIS 6, MO.

Sales Agencies in All Principal Cities Including

CHICAGO 5, 37 W. Van Buren — NEW YORK 7, 15 Park Row — PHILADELPHIA 6, PA., 11 N. Fourth St.

Write for Bulletin 619

THE WILLIAMS PATENT CRUSHER & PULVERIZER CO. ST. LOUIS TRADE MARK REG. U.S. PAT. OFF.

Williams

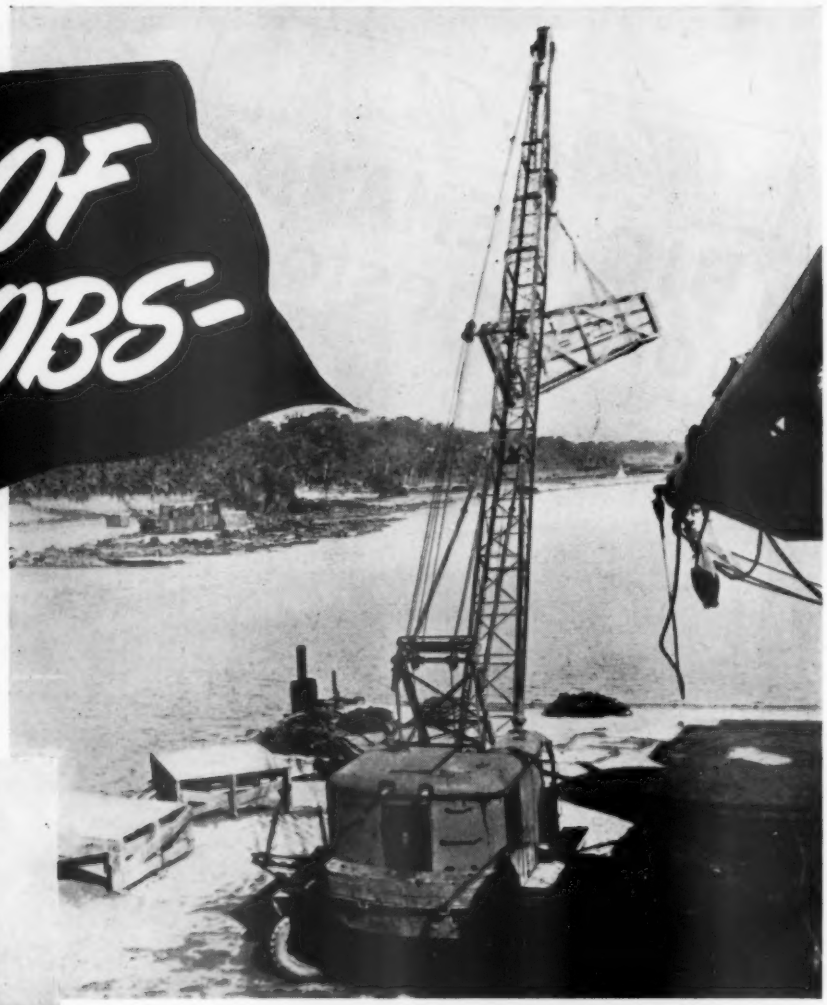
OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD

WILLIAMS

PATENT CRUSHERS GRINDERS SHREDDERS

JACK OF ALL JOBS-

in heavy materials handling



Above—Vital supplies and equipment being unloaded by a "Fighting Osgood Mobilcrane" in the South Pacific.

Osgood "20" driving piles for a landing pier in North Africa.

Helping to clear the way to Berlin and Victory, "Fighting Osgoods" serve under fire with Army Engineers in Europe, as well as on other battle fronts.

"FIGHTING OSGOODS" LIFT, DIG AND DRIVE IN THE BATTLE OF SUPPLY

When the engineer troops and SeaBees "go in" on the heels of our attacking forces, they need the right equipment to do a multitude of jobs quickly and efficiently. Roads and air fields must be leveled, loading docks built, supplies loaded and unloaded, rubble cleared away fast.

Osgood shovels and cranes figure dependably in all these operations . . . working as crane, pile driver and shovel. They're engineered with the power, stamina and versatility to keep precision planning and production on schedule. You'll appreciate these advantages when *your* planning goes into action after Victory.

WHEN IT'S WAR BONDS, BUY MORE THAN BEFORE!

THE GENERAL EXCAVATOR COMPANY
GRANES, DRAGLINES AND SHOVELS
DIESEL, GAS, ELECTRIC

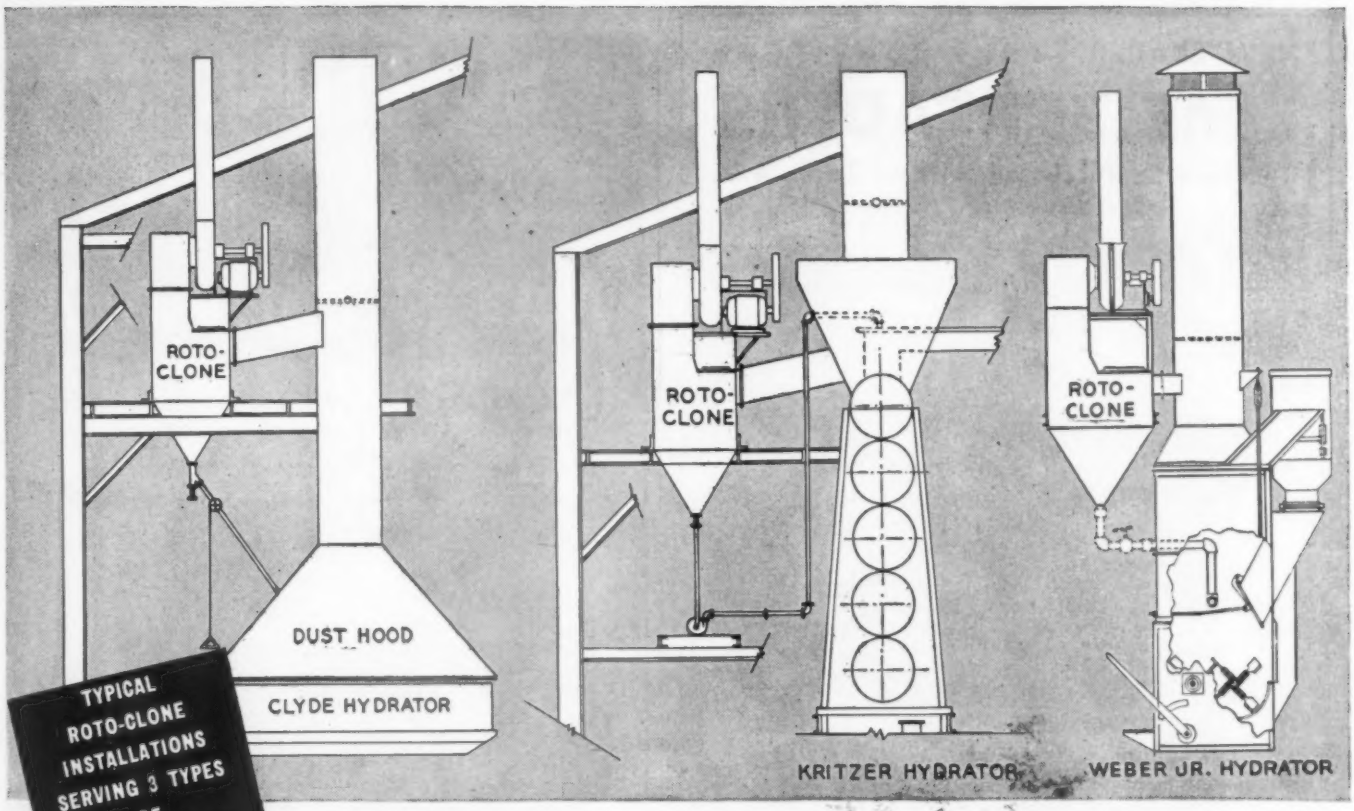
Associated with The General Excavator Company

OSGOOD

THE OSGOOD COMPANY • MARION, OHIO

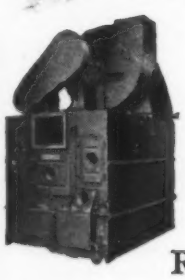
ARMY E NAVY

OSGOOD
SHOVELS, DRAGLINES
CRANES



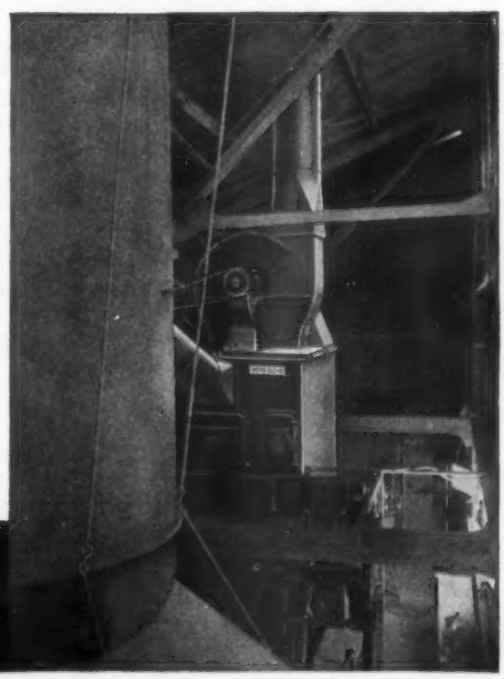
TYPICAL ROTO-CLONE INSTALLATIONS SERVING 3 TYPES OF LIME HYDRATORS

ROTO-CLONE MAKES LIME DUST RECOVERY PAY DIVIDENDS



Savings up to several tons of lime per day not only pay for the operating current, but also in time pay for the Roto-Clone equipment used to accomplish this remarkable job. After collecting *all* dust from the vented steam and air, the resulting lime slurry is automatically piped direct to the hydrating pan. Write for complete information and Type N Roto-Clone bulletin No. 277. Roto-Clones are available in capacities of 1,000 to 25,000 c.f.m.

- **Recovers up to several tons of lime per day's operation**
- **Eliminates cleaning of roof**
- **Stops neighborhood complaints**



AMERICAN AIR FILTER CO., INC.
Incorporated
192 Central Avenue, Louisville 8, Kentucky
In Canada: Darling Bros., Ltd., Montreal, P. Q.

ROTO-CLONE
FOR ROCK PRODUCT DUST CONTROL

NEW LEADER Truck Body Type

LIME SPREADERS

Can Now Be Purchased Without Triple AAA Certificates or Priority

THE above picture shows a rear view of the new model NEW LEADER marl and lime spreader. This spreader is equipped with an extra wide conveyor and two distributor discs and is strictly a one-man spreader. You will be able to haul wet lime or marl and, due to the large opening in the back end of the spreader, material will always feed onto the distributor disc evenly.

This spreader has many outstanding features. Both gear boxes driving the distributor discs are equipped with cut steel gears and ball-bearings running in a dust-proof and oil-tight gear case. The large gear box driving the wide chain conveyor is equipped with a steel ring gear and pinion and a thrust bearing also running in a dust-proof and oil-tight gear case. Bearing hangers are placed underneath the distributor discs; these are also equipped with ball bearings. This helps to carry the weight of the distributor discs and the load, the weight not being suspended from the gears in the small gear box. With this arrangement you are assured longer lived gears. The framework of the spreader is of hardwood.

These spreaders can now be purchased without priority or certificates of any kind. Write us for any additional information, also prices.

We now have territory available for dealers—write us for details.

HIGHWAY EQUIPMENT COMPANY, INC.

Manufacturers of the World's Most Complete Line of Spreaders, Including Lime Spreaders, Sand and Cinder Spreaders, Chip Rock, Clay and Dirt Spreaders.

CEDAR RAPIDS, IOWA, U. S. A. Phone 32017-32018

HOW FLINK ONE MAN SPREADER PAYS WAY *on Rainy Days*

No shoveler or helper needed . . . spreads more lime in less time . . . permits use of truck for other purposes when fields are wet—and when crops are growing.

YOU CAN MAKE MONEY with your Flink equipped truck 365 days in the year! TRUCKS EQUIPPED with Flink Self-Feeding Lime Spreaders are not limited to the spreading of lime alone. No need having an idle truck stand around all day costing you $25 in income and expense. Equip your dump trucks with Flink Self-Feeding Spreaders. Spread more lime in less time with less help and less expense when fields are dry and during seasons when lime spreading can be done . . . on other days and during off seasons, spread sand, gravel, haul equipment, do road work, truck coal, or use your truck for any of the hundred other jobs for which it was built.

THE FLINK SPREADER is a replacement end gate which can be removed in 5 minutes if you desire, or you can still go ahead hauling and dumping with the Flink spreader left on. Does not interfere with general use of truck.

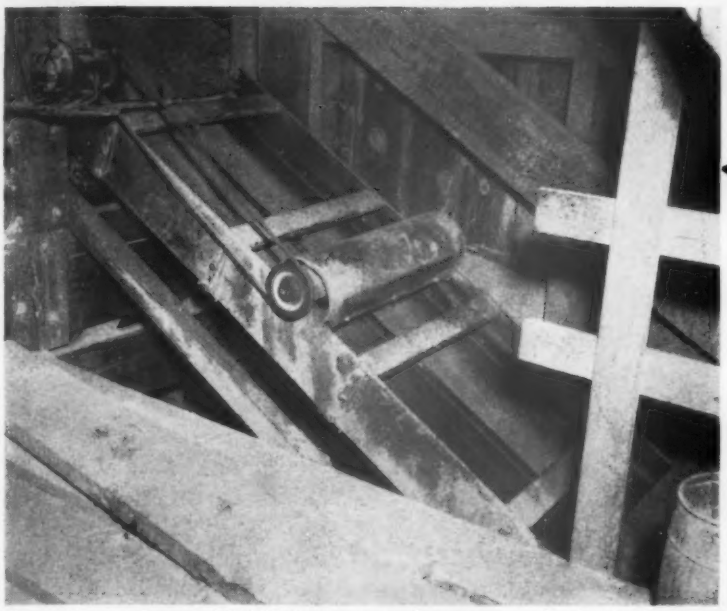
SPREADS ALL GRANULAR MATERIALS up to 1", thick or thin, wet or dry, forward or backward, without a helper on the back. Spreads 15' to 28' wide, depending on type of ground and nature of material. Built for hard use.

Write for complete literature.

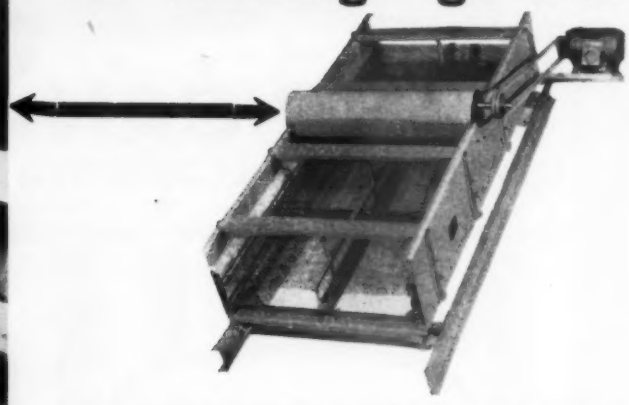
The FLINK COMPANY

509 VERMILLION STREATOR, ILLINOIS

UNIVERSAL . . . the "Ideal Screen" for making Agstone



One of a number of UNIVERSALS, which have operated reliably for many years at the Consumers Company Plant at Hillside, Ill. Five late model UNIVERSALS are being installed this Spring for increased Agstone production.

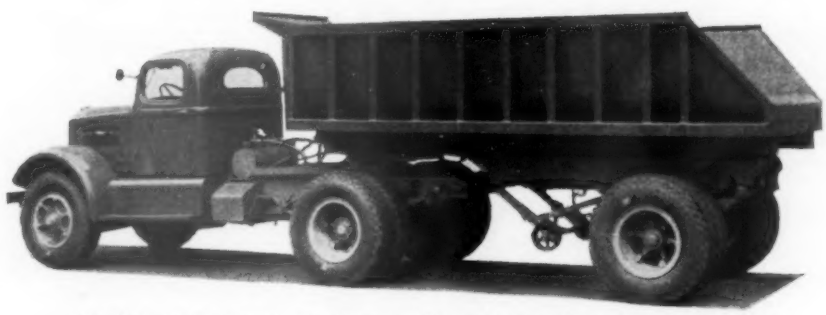


For fine separations on your damp, sticky limestone screenings, you need the UNIVERSAL Vibrating Screen.

Convincing proof of UNIVERSAL'S superior performance in screening efficiency is reflected by the many repeat orders we receive from producers of agricultural limestone.

Let us send you our 32 page catalog. Write today!

UNIVERSAL VIBRATING SCREEN CO.
RACINE ~ ~ WISCONSIN



Model 5SF Semi-Trailer with 10 Cu. Yd. Rock Body

SEMI-TRAILER DUMP UNITS

WITH ROCK TYPE OPEN END OR STANDARD TAIL-GATE TYPE BODIES FOR ALL TYPES OF BULK MATERIAL HAULING ARE AVAILABLE FOR SALE TO APPROVED USERS.

COMPLETE INFORMATION FURNISHED ON REQUEST

TRUCK ENGINEERING CORPORATION
CLEVELAND 2, OHIO

AMERICAN EXPLOSIVES

From well-located plants and distributing magazines, AMERICAN explosives and blasting supplies are available for delivery throughout the eastern and middle-western sections of the United States. Produced under intensive research, chemical control, inspection and unremitting care in manufacture, there is an AMERICAN explosive suited to your requirement.

• *Capable field engineers are available at your call.*

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A Unit of American Cyanamid Company

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SALES OFFICES: PITTSBURGH, Pa. Bluefield, West Va. Scranton, Pa. St. Louis, Mo. Chicago, Ill. Pottsville, Pa. Hazleon, Pa. Maynard, Mass.

States' Highway Programs Will Be Far in Excess of Federal Budget

By BETHUNE JONES

POST-WAR highway-construction preparations have been occupying the attention of state legislatures throughout the country.

New York State now has a $310,000,000 fund earmarked for post-war construction of highways, public buildings and other projects. Governor Thomas E. Dewey is on record in favor of a contemplated 5-year highway program involving the expenditure of $840,000,000.

A gasoline-tax increase of 1½ cents per gallon has been proposed in California to aid in financing a proposed ultimate billion-dollar post-war highway construction program.

In Connecticut, where the state highway department is planning a $250,000,000 long-range highway development and integration program, a bill has been proposed to increase the gasoline tax rate from 3 to 4 cents.

Oregon's State Highway Commission has suggested projects which would cost a total of $350,000,000, but only a small portion of these can be included in the state's post-war highway-construction program with funds expected to be available.

A $5,000,000 bond issue to enable Delaware to take advantage of available federal funds for post-war highway construction has been urged by Governor Walter W. Bacon.

Governor Herbert B. Maw of Utah recommended an increase in that state's gasoline tax, from 4 to 5 cents a gallon, to finance post-war highway construction.

To aid in financing contemplated highway construction in Massachusetts, Governor Maurice J. Tobin proposed that the gasoline tax rate be raised from 3 to 4 cents per gallon.

Alabama's gasoline tax would be lifted from 6 to 7 cents a gallon to raise funds for apportionment among municipalities under a proposal advanced by Ed E. Reid, executive director of the Alabama League of Municipalities. The 1945 Alabama Legislature is not scheduled to convene until May 1.

Governor Andrew F. Schoeppel of Kansas has suggested that post-war highway construction be financed either through higher gasoline taxes or borrowing against anticipated highway income.

Governor Sam C. Ford asked the Montana Legislature to consider provision for financing a long-term highway program. He pointed out the state could get through the first year of a program using available federal aid, but that additional revenue would be needed in subsequent years.

Bond issuance or a gasoline-tax increase were suggested in South Dakota, despite the fact that Governor M. Q. Sharpe early in the year expressed the belief that no new taxes would have to be levied.

North Dakota voters last November approved a proposal to permit the issuance of up to $12,360,000 in highway-revenue anticipation certificates to raise revenue to match federal funds for road construction and improvement.

Governor Edward Martin urged the Pennsylvania Legislature to keep that state's gasoline-tax rate at 4 cents per gallon. He recommended that a 1-cent gasoline levy, originally adopted in 1935 as an emergency measure, be re-enacted and transferred from the general fund to the motor-license fund for rebate to local governments for local road, street and bridge purposes.

In Nevada Governor E. P. Carville expressed belief that no additional state taxation will be needed to enable that state to match post-war federal highway aid.

Vermont's State Highway Department, which has outlined needed highway improvements costing approximately $57,000,000 which could be carried out over a 20-year period, declared that Vermont "will need to strain its highway funds to the utmost" to match post-war federal aid.

A motor-fuel tax increase of 1 cent has been advocated in Colorado by the State Highway Department, but Governor John C. Vivian is on record as favoring a "pay-as-you-go" highway-construction plan.

Governor Ernest L. Bailey of West Virginia suggested an appropriation of $4,000,000 from that state's surplus to enable the road commission to launch a two-year $8,000,000 secondary-road building program.

NOT ONE FAILURE in a Million!

Write for EVANSTEEL Bulletin

. . . that's a pretty good record but it is the one established by our chrome-nickel alloy ROPE SOCKETS.

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Yes, we have been making them for 36 years without a single recorded failure.

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Take a lesson from experience, and specify . . . EVANSTEEL Rope Sockets. They are stronger, lighter, and cost less.

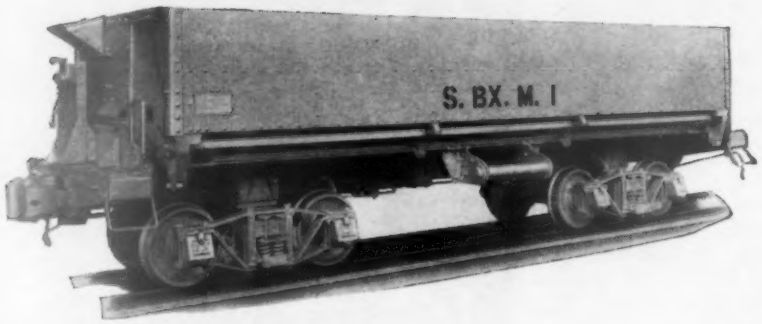
CHICAGO STEEL FOUNDRY COMPANY

PYRASTEEL for high temperatures

KEDZIE AVE & 37TH ST.
CHICAGO 32, ILL.
Makers of Alloy Steel for 30 Years

EVANSTEEL for strength

Steelcar MODERN

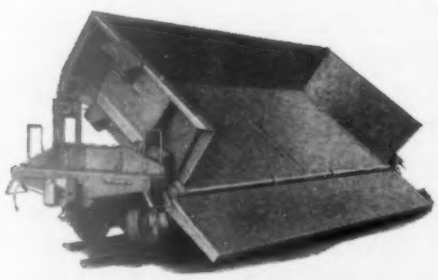


ALL-STEEL
AIR DUMP CARS

. . . for greater efficiency in handling BAUXITE ORE

- 14.5 cubic yards level capacity
- 19 cubic yards with average 30° heap
- Load carrying capacity, 45,000 pounds

Small hand dump cars were originally contemplated at this open-cut bauxite ore mine in South America but on the recommendations of Pressed Steel Car engineers, a larger car was substituted with the result that instead of hundreds of small cars, less than half the number were required to handle the full output of the mine. Thus the initial investment in cars was substantially reduced and worthwhile savings year after year were achieved in operating and maintenance costs.



These cars are dumped by a single pneumatic cylinder installed at the hopper leading to the primary crusher. Bulletins on request.

Designers and Builders of Railway Cars Since 1898

PRESSED STEEL CAR COMPANY, INC.
INDUSTRIAL DIVISION
PITTSBURGH, PA.

A number of states may be confronted with the alternatives of revising their tax structures or losing a portion of their post-war federal highway aid allotments if the federal government strictly enforces penalties against states which divert highway user tax receipts to unrelated purposes, as had already been threatened at this writing in at least one significant instance.

There were indications that fiscal disruption threatened by the problem in some states which have relied heavily in the past on highway user tax funds to finance general governmental functions might lead to pressure for easing or elimination of the present federal statutory provision for such penalties. On the other hand, with federal aid assuming a vastly more important role in highway financing, non-diverting states and highway users were expected to increasingly demand stricter rather than more lax enforcement of anti-diversion provisions.

Oklahoma legislators were warned in late January by Federal Public Roads Commissioner Thomas H. MacDonald that the state would lose a portion of its post-war federal aid road grants unless it ceased diverting approximately $8,000,000 a year of automotive tax receipts to non-highway purposes.

According to figures compiled by the Federal Public Roads Administration, the following states diverted the following amounts in 1943 to non-highway purposes: Alabama, $920,000; California, $16,063,000; Florida, $12,077,000; Georgia, $6,622,000; Illinois, $4,729,000; Indiana, $431,000; Kentucky, $747,000; Louisiana, $5,086,000; Maryland, $395,000; Massachusetts, $869,000; Nebraska, $2,024,000; New Jersey, $8,766,000; New Mexico, $537,000; New York, $33,421,000; North Carolina, $1,064,000; Ohio, $11,122,000; Oklahoma, $7,091,000; Pennsylvania, $10,965,000; Rhode Island, $3,078,000; South Carolina, $376,000; Tennessee, $7,112,000; Texas, $11,187,000; Utah, $426,000; Washington, $462,000; Wisconsin, $9,175,000, and the District of Columbia, $330,000. Several other states were listed as diverting lesser amounts, with the total amount of state highway user revenues diverted to non-highway purposes in 1943 recorded as $155,455,000.

State constitutional prohibitions against highway fund diversion were adopted last year in Maine and Washington, bringing to 16 the numbers of states which have written provisions of this sort into their basic law.

PERSONAL MENTION

JAMES F. BACON, engineer, who has been associated with the mining division of the War Production Board since the day after Pearl Harbor as chief of the non-metallic section, was recently granted a release from that agency.

James F. Bacon

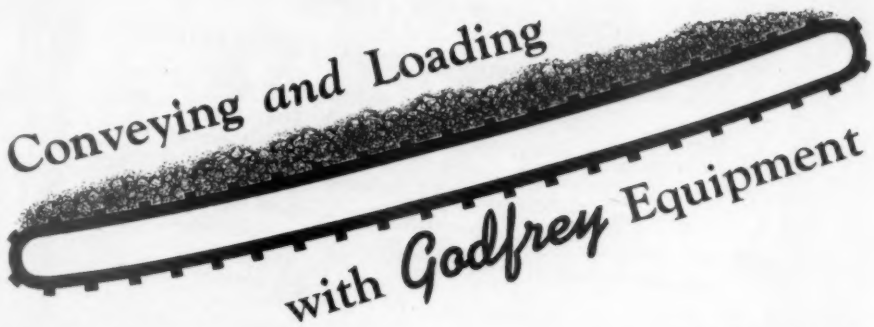
Mr. Bacon will henceforth give a special technical counselor service to the mining and mineral milling industry, and will set up complete office facilities in Washington, D. C. He has been retained as technical counselor by the Separation Engineering Corporation, which acts as manufacturers agent for equipment used in crushing, screening, separating or beneficiating ores or other materials.

HENRY K. HARTMEN recently was made sales manager of the Lawrence Portland Cement Company's Philadelphia district. Mr. Hartman formerly was assistant sales manager for the district.

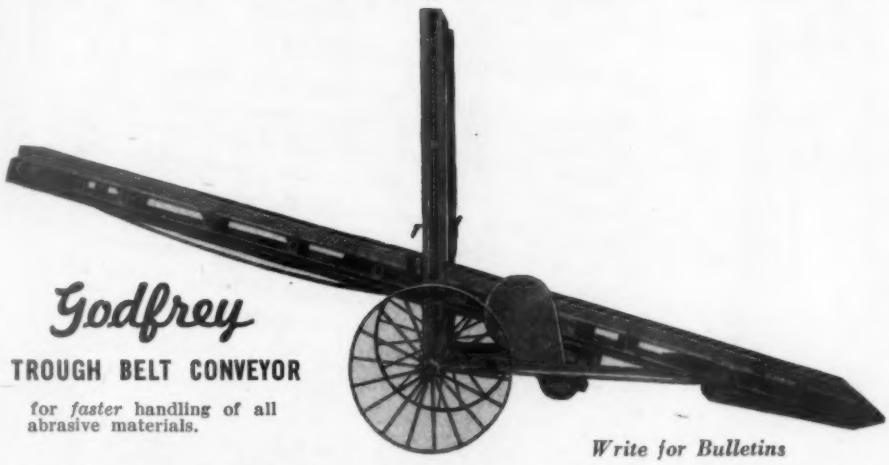
MARK SMALL, Lone Star Cement Company representative at Kansas City, Missouri, recently was promoted to the office of vice-president of the Kansas division. Mr. Small formerly represented the Portland Cement Association in Alabama.

MAYNARD H. VAN ORNUM, formerly with the Bureau of Mines, has accepted a post as mining engineer for the United States Gypsum Company at Plasterco, Virginia.

SAVE *Manpower* HERE



SERVE *Manpower* THERE



Godfrey
TROUGH BELT CONVEYOR
for *faster* handling of all abrasive materials.

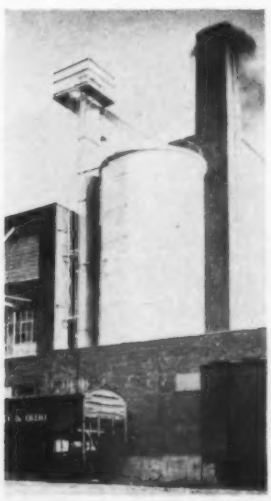
Write for Bulletins

GODFREY material handling machines enable fewer men on the home front to do the work of many in delivering a continuous stream of supplies to the fighting forces.

GODFREY Conveyors and Loaders combine maximum strength and wear resistance with extreme mobility, and inexperienced help can quickly learn to operate them.

Sand, gravel and crushed stone producers and general contractors can "stretch" their plant facilities further by substituting GODFREY units for slow and costly hand loading.

This Type Conveyor is especially recommended for road builders, quarrymen and contractors who are handling crushed stone, sand, and other abrasive materials.



Godfrey supplies highly economical and efficient silo equipment for handling building materials, coal, and similar products. Installations to meet any capacity needs.

GODFREY CONVEYOR CO. **Elkhart 6, Ind.**

CLASSIFIER PERFORMANCE QUIZ!

NAME OF CLASSIFIER . . . EAGLE . . .

Q. 1. DOES IT CLASSIFY MATERIALS EFFECTIVELY?

Ans. Yes. Eagle Classifiers are designed to take care of the individual conditions encountered. They are in service today handling materials as fine as 350 mesh. The basic principles necessary for effective settling, classifying and dehydrating—longer tubs, fresh water inlet control, adjustable baffles, etc., are built into every Eagle.

Q. 2. DOES IT DEWATER EFFICIENTLY?

Ans. Yes. The Eagle's longer tub and carefully designed screw permit reduction of moisture content to be controlled to a high degree. When handling material up to 100 mesh, reduction to 9-10% moisture content is possible.

Q. 3. IS IT ECONOMICAL TO MAINTAIN?

Ans. Yes. Interchangeable sectional screw flights permit replacement of lower section (which receives most wear) while upper section is still good. All flights are cast of special, chilled alloy steel with a wearing surface hardness of 600 Brinell. Drive bevels and pinions are precision cut steel gears. Timken roller thrust bearings are used on upper end of screw shafts. Marine type composition bearings are used on the lower end of screw shafts. All materials are selected for efficient performance and long life.

Q. 4. WILL IT DO MY JOB?

Ans. Yes. Eagle Classifiers are made in many different sizes and styles, both single and multiple screw types. Special attachments and adaptations are used to meet unusual conditions.

Let an Eagle "feather your nest!"

EAGLE IRON WORKS
133 Holcomb Avenue
Des Moines, Iowa

EAGLE *Specialized Sand and Gravel Equipment*
"SWINTEK" DREDGE LADDERS — SCREW WASHERS
LOG WASHERS — DEHYDRATORS — SAND TANKS
CLASSIFIERS — REVOLVING SCREENS

EAGLE IRON WORKS
DES MOINES, IOWA

"SERVING INDUSTRY FOR OVER SEVENTY YEARS"

WILLIAM W. ADAMS, Bureau of Mines authority on accident statistics, who advanced from junior clerk to head of the division he helped institute 34 years ago, retired February 28 as chief of the bureau's accident analysis division.

Mr. Adams had been in Federal service for 38 years, the last 34 continuously with the Bureau of Mines. Author of virtually all of the bureau's statistical publications on fatal and nonfatal accidents in the mining industries for the last 25 years, Mr. Adams was largely responsible for the establishment of a uniform system of reporting coal mine accidents in the United States.

With the transfer of the division of mineral research and statistics from the Geological Survey to the Bureau of Mines in 1925, Mr. Adams became assistant chief of the division. To further the study of accidents and establish a competitive basis among mining companies, Mr. Adams in 1925 established, in cooperation with *Explosives Engineer Magazine,* the National Safety Competition, which he has conducted annually since that time.

J. W. SHARP, general superintendent in charge of operations at the Permanente Cement Company, Permanente, California, was married to Miss Barbara Ferrin of San Jose on February 19.

EDMUND D. WINGFIELD recently became assistant general manager of the Freeport Sulphur Company of New York City. Mr. Wingfield had previously been administrative superintendent of the company's offices in New Orleans.

ARNOLD A. GUSTAFSON recently left his duties as mining engineer of the Freeport Sulphur Company in Cuba to become resident manager of the Freeport Exploration Company at Toronto, Canada.

WALTER O. MCCLINTOCK, former assistant superintendent of electrolysis with Basic Magnesium, Inc., recently joined the research department of the International Minerals and Chemical Corporation at Mulberry, Florida.

ERNEST R. RODRIQUEZ, formerly chief mine engineer for Basic Refractories, Inc., at Gabbs, Nevada, recently became affiliated with the Magma Copper Company, Superior, Arizona.

MANNING P. GREER, safety director of the Marquette Cement Manufacturing Company at Cape Girardeau, Missouri, recently was transferred to the sales department of the company in Chicago. Anderson Hayden, his former assistant, succeeded Mr. Greer as safety director at Cape Girardeau.

S. G. MCANALLY, who formerly was Pennsylvania-Dixie Cement Corporation's plant superintendent at Clinchfield, Georgia, recently accepted a position with Cio Cimento Braziliero for the construction and operation of a cement plant in Brazil.

GUY O. GARDNER, superintendent of the Chanute, Kansas, plant of the Ash Grove Lime and Portland Cement Company, Kansas City, Missouri, recently was made manager and research director of the company's plants in Kansas, Missouri and Nebraska.

DIXON CHUBBUCK, vice president of the Chubbuck Lime Company, Los Angeles, is now a colonel in the United States Army and is stationed at Seattle where he looks after the sending of supplies to the armed forces in Alaska and the Aleutians. Colonel Chubbuck was recently awarded the Legion of Merit for distinguished service.

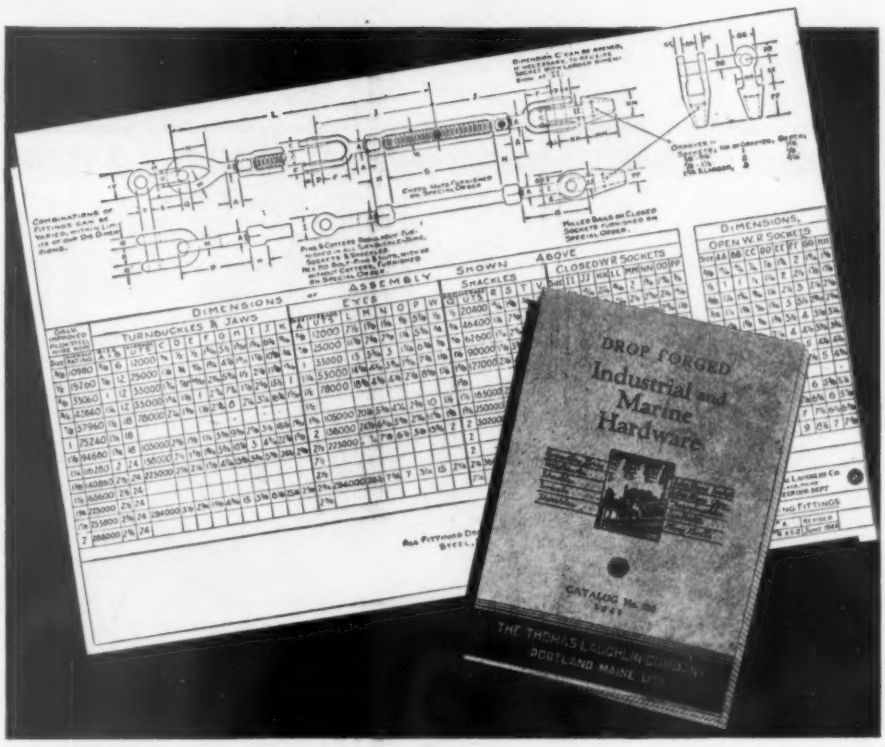
F. GRAYSON MEYERS recently was made superintendent of the Portland, Colorado, plant of the Colorado Portland Cement Company. Mr. Myers, who formerly was chief engineer at the Portland plant, succeeded H. L. Lucas, acting superintendent.

JOHN J. HEFFERNAN has been appointed purchasing agent of the Universal Atlas Cement Company and the Atlas Lumnite Cement Company, United States Steel Corporation subsidiaries, effective April 1. He succeeds the late Richard B. Hynes, who died March 21.

VINCENT P. AHEARN, secretary of the National Sand and Gravel Association, was recently named an alternate industry member of the War Labor Board.

WALLACE E. WING, president, and all other officers of the Marblehead Lime Company of Chicago recently were re-elected at the directors' meeting of the company.

NEW CATALOG ON THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



NEW ITEMS . . . NEW ENGINEERING DATA
SIMPLIFY SELECTION OF THE RIGHT FITTINGS

To simplify your job of selecting the right combination of fittings for any wire rope or chain assembly . . . Laughlin's new Industrial and Marine Hardware Catalog No. 135 is now ready.

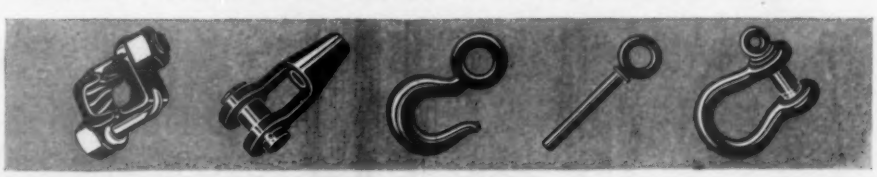
This catalog displays every item in the most complete line of drop-forged wire rope and chain fittings on the market. New items have been added since the last catalog was published — and your nearby mill, mine or oil field supply house is taking orders for them.

New engineering data and tables simplify such problems as picking the right hook for a specified rope or chain size and safe load . . . the right products for a turnbuckle assembly with shackles or sockets . . . and many others.

Your file of vital buying information will not be complete until you have this handy catalog at your finger tips. Write on your business letterhead for your copy of Catalog 135. Dept. 3, The Thomas Laughlin Co., Portland 6, Maine.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



WADE W. POSTELLE was named local auditor of the Independence, Kansas, plant of the Universal Atlas Cement Company, United States Steel Corporation subsidiary, to succeed Clarence Graves, Jr., who resigned. Mr. Postelle is transferring from the Leeds, Alabama, plant where he has served as local auditor since 1942.

HENRY F. KOCH of the Koch Sand & Gravel Company, Evansville, Indiana, has donated $30,000 toward the construction of a new home for the city and county blind. Work rooms, a recreation hall and a chapel will be included in the building. Construction is scheduled to begin as soon as priority rules have been lifted.

HERBERT E. MANAHL recently was named general superintendent of the Elmhurst-Chicago Stone Company, Elmhurst, Illinois, to succeed M. M. Bales, who retired after 24 years with the firm.

T. W. SHOOK recently was named manager of sales for Basic Refractories, Inc., of Cleveland, Ohio, succeeding the late Huntington Downer.

CHESTER A. FULTON, president of the Southern Phosphate Corporation of New York for the last 17 years, recently resigned from his office to take up a private practice as a mining engineer.

OBITUARY

Eugene H. McEuen

EUGENE H. McEUEN, 59, supervising engineer for the Chubbuck Lime Company of California, passed away recently at South San Francisco. Mr. McEuen had been active for over 30 years in the designing, erection and operation of lime plants in the Middle West and on the Pacific Coast. Before joining the Chubbuck interests he had been associated with the Marblehead Lime Company of Chicago and the Auburn Chemical Lime Company of California.

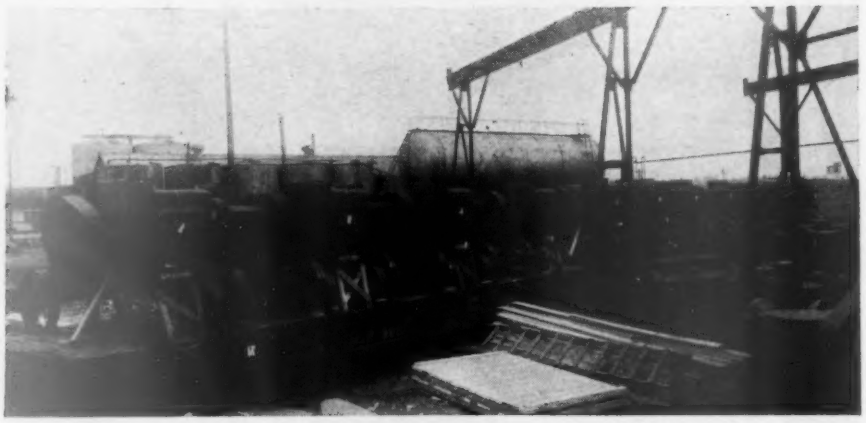
BEN D. REYNOLDS, Webb City-Joplin, Missouri, civic leader, and president and manager of the Independent Gravel Company, died recently at the age of 61.

Mr. Reynolds, who had directed the gravel concern for the last 35 years, was born May 31, 1883, in Terre Haute. He had made his home in Webb City since 1904. At the time of his death, he also was the president of the Calcium Carbonate Company of Chicago.

HARRY P. THOMSON, SR., 67, president of the Deitz Hill Development Company, Kansas City, Missouri, died March 22 at his home in Kansas City. Mr. Thomson was associated with his brother, Lawrence E. Thomson, in a contracting and crushed-stone business prior to his affiliation with the Deitz Hill Development Company.

RICHARD B. HYNES, 49, purchasing agent for the Universal Atlas Cement Company and the Atlas Lumnite Cement Company, both of New York City, died March 21 at his home in Scarsdale, New York. Mr. Hynes had been associated with these firms and the old Atlas Portland Cement Company since 1916.

GRUENDLER CRAFTSMANSHIP SERVING INDUSTRY 60 YEARS



Partial Shipment of Gruendler Portable Crushers

1500 Units

TO THE ARMY AND NAVY...

That is why we haven't been able to do very much for our friends in civilian clothes.

Carload after carload has gone out from GRUENDLER to all parts of the world.

Working for the Army and Navy has been a great experience—and a good one too. We have learned a lot of things that are going to make GRUENDLER CRUSHERS do a better job in a better way than ever before.

Some units have now been released and are in production. Write for data and delivery dates.—The unit you want may be available.

GRUENDLER ST. LOUIS, U.S.A.

GRUENDLER

CRUSHER and PULVERIZER CO. • ST. LOUIS 6, MISSOURI

WALLACE L. CALDWELL, president of the Alabama Asphaltic Limestone Company and former president of the Associated Industries of Alabama, died April 2 in Birmingham of injuries received in an automobile accident. A native of Indiana, he was an engineering chemist for the city of Indianapolis before going to Birmingham.

From 1921 to 1925 Mr. Caldwell served as president of the Kentucky Rock Asphalt Company of Louisville, and from 1925 to 1928 he was vice-president of the Peoples Light and Power Company of New York.

In 1928 he returned to Birmingham and founded the Alabama Asphaltic Limestone Company. He was the inventor of the light-weight slag machine used by the Celotex Corporation of Chicago.

JOSEPH HOCK, 72, retired president of the Consumers Company and former president of the Wisconsin Lime & Cement Company, Chicago, died at his home in Oak Park, Illinois, April 22.

LT. MARTIN M. HAMMERSCHMIDT, 21, son of Martin Hammerschmidt, secretary-treasurer of the Elmhurst-Chicago Stone Company, Elmhurst, Illinois, died of wounds received in action in Germany on March 1.

JOHN E. KELLY, superintendent of Warner Company's McCoy plant at Swedeland, Pennsylvania, died recently. He had been plant superintendent since 1928.

LIBRATO LATTANZIO, 59, vice-president of Lattanzio Brothers, sand and gravel producers of Schenectady, New York, died recently. Mr. Lattanzio and his brother Antonio founded the firm.

JOHN EDWARD NOELP, 57, for 14 years president of the Newark Sand & Gravel Co., Newark, Ohio, died April 4 in Columbus. In the construction business all his life, Mr. Noelp was a member of the Columbus real estate board.

LESLIE M. HANSEN, 55, president of the Industrial Silica Corporation of Youngstown, Ohio, and a chemical engineer, died March 18 at his home at Barrington, Illinois.

ANDREW L. HERSTER was recently appointed assistant treasurer and a director of the General Crushed Stone Company, Easton, Pennsylvania.

In making your post-war plans, you'll want to install the light-weight pipe that can give you the stepped-up performance required for more profitable operation.

No other light-weight pipe combines all the advantages of Naylor's exclusive Lockseam Spiralweld structure. You'll like its light weight. Its greater strength. Its speed of installation. Its leaktightness. Its extra safety. Its revolutionary coupling methods. Its savings, high salvage and re-use value. It will pay you to do your mental shopping now and include Naylor Pipe in your post-war plans.

Specify Naylor Pipe for high pressure hydraulic lines, high or low pressure air and water lines, de-watering, drainage, ventilating and sludge lines. Sizes from 4" to 30" in diameter, lengths up to 40 feet. All types of fittings, connections and fabrications.

NAYLOR LOCKSEAM SPIRALWELD PIPE

NAYLOR PIPE COMPANY
1257 EAST 92nd STREET, CHICAGO 19, ILL.
New York Office:
350 Madison Ave., New York 17, N. Y.

TRAFFIC News Digest

CENTRAL FREIGHT ASSOCIATION

Docket 77355 (2).—Cement and related commodities shown in Note 4 of N.Y.C. tariff 306 and Item 5 of PRR tariff 36-F. Establish on, from Fultonham, Ohio (N.Y.C.-W) and East Fultonham, Ohio (P.R.R.) to B. & O.R.R. and Monongahela Railway stations in West Virginia rates as shown in Exhibit C, subject to Ex Parte 148 increase suspended.

Docket 77358 (1).—Industrial sand, subject to Column A, B and C ratings and minimum weights as described in G. T. W. R. R. Tariff 312-T. Establish on, from Grand Haven, Muskegon and Rosey Mound, Michigan, to Zeigler, Illinois, Column A 308 cents; Column B 339 cents; Column C 308 cents per net ton, subject to Ex Parte 148 increase, suspended.

Docket 77362 (2).—Limestone quarry waste (not suitable for building purposes) carload, in open-top cars, minimum weight 90 per cent. of the marked capacity of the car except that, when the car is loaded to its full cubical or visible capacity, the actual weight will apply. Establish on, from North Vernon, Indiana to Yorktown, Indiana 116 cents per ton.

Docket 77366 (2).—Agricultural limestone, unburned (not ground or pulverized), in bulk, in open-top cars, carload minimum weight 90 per cent. of the marked capacity of the car, except that, when the cars are loaded to their full cubical or visible capacity, the actual weight will apply. Establish on, from Bellevue, Ohio, to Dillonvale, Glen Run, Maynard, Ohio 138 cents; to Neffs and Steubenville, Ohio, 149 cents per net ton.

Docket 77383 (1).—Lime, *viz.:* Agricultural, common, hydrated, quick or slaked, minimum weights 30,000 and 50,000 pounds. Establish on, from Annandale, Branchton, Harrisville and Osbornes, Pennsylvania, to points in New York and Pennsylvania, published in B. & L. E. Railroad Tariffs ICC 1114 and 1115, representative points.

Docket 77375 (1).—From Central Freight Association territory to Western Trunk Line Committee territory. Dolomite, roasted, carload, minimum weight 100,000 pounds. Establish on, from Durbin, Ohio, to Provo, Utah, 1105 cents per net ton.

Docket 77397 (2).—Stone, fluxing, furnace or foundry, melting or refractory (unburned) in bulk, in open-top cars, carload minimum weight 90 per cent. of the marked capacity of the car furnished, except that, when the car is loaded to its full cubical or visible capacity, the actual weight will apply. Establish on, from Hillsville, Shaw Junction, Walford, Pennsylvania, to West Homestead 103 cents per gross ton, subject to Ex Parte 148 (suspended).

Bulletin 1659.—Proposal to establish rates shown below on slag, crushed or crushed commercial (not granulated), a product of iron and steel blast or open-hearth furnaces, in bulk, carload, minimum weight 90 per cent. of the marked capacity of the car, etc., from Hamilton, Ohio:

	Rates (Cents Per Net Ton)	
	Closed Cars	Open Cars
To		
Connellsville, Pa. ...	275	253
Lancaster, O.	165	...
Winchester, Ind. ...	132	105
Clarion, Pa.	297	...
Hillsboro, Ill.	242	204
Fairmont, W. Va. ..	253	209
Brockway, Pa.	297	275
Washington, Pa.	242	220

ILLINOIS FREIGHT ASSOCIATION

Docket IRC 511-220.—Agricultural limestone, also ground limestone dust and limestone, ground, carload, from Falling Springs, Illinois to Sumner, Bridgeport and Lawrenceville, Illinois. present, $1.10; proposed, 99 cents.

Docket 511-222.—Stone, crushed, etc., as described in Rule 20, I.C.R.R. Tariff 13321-I, I.C.C. A-11296 minimum weight 90 per cent. of the marked capacity of the car, except that, when the car is loaded to its full cubical or visible capacity, the actual weight applies, from Krause, Illinois to Bradfordton, Illinois. Present, $1.68 per ton; proposed, $1.24.

Docket I.R.C. 511-224.—Sand and gravel, carload minimum weight 90 per cent. of the marked capacity of the car, except that, when the car is loaded to its capacity, the actual weight but not less than 40,000 pounds will apply, from Peoria to Waverly, Illinois. Present, 85 cents net ton applicable only as a terminal rate, proposed, $1.24.

Docket I.R.C. 511-223.—Sand, molding, carload, minimum weight 90 per cent. of the marked capacity of the car, except that, when the car is loaded to its capacity the actual weight but not less than 60,000 pounds will apply, from Savanna to Havana, Illinois. Present, combination; proposed, $1.53 net ton.

ONLY HERCULES DELIVERS ALL THESE features

CENTER-LIFT HOIST
REVERSIBLE TAILGATE HARDWARE
PISTON-TYPE CONTROL VALVE
HOIST MOUNTS ABOVE FRAME
EASY-REACH TAILGATE LEVER
ACCESSIBLE HOIST CYLINDER
DASH CONTROLS FOR HOIST AND TAKE-OFF
PATENTED TIRE AND TOOL PACK

Bigger payloads unloaded faster—less maintenance—greater profits—these are the advantages of Hercules construction . . . advantages that make Hercules dump bodies worth waiting for!

While you're waiting, your Hercules distributor can be of service, keeping your present equipment in top working order. He has the mechanical facilities, the replacement parts and the trained personnel needed to maintain your overworked equipment.

HERCULES
DUMP BODIES AND HYDRAULIC HOISTS
SPLIT SHAFT POWER TAKE-OFFS • COAL CONVEYORS

Buy War Bonds
Invest in America's Future and Your Own

HERCULES STEEL PRODUCTS COMPANY . . . GALION, OHIO

Legal Decisions

By LEO T. PARKER

●

Refusal to Submit to Operation

Generally speaking, modern higher courts refuse to allow full compensation to employees who refuse to submit to operations approved and recommended by competent physicians. For example, in *Kentucky Cardinal Corporation v. Delph,* 176 S. W. (2d) 886, it was shown that an experienced miner about 43 years of age at the time of his injury was attending to his work when a large quantity of rock fell, catching and badly crushing his hand and wrist. The physicians recommended that his arm be amputated but the employee refused to submit to the operation. The commission allowed compensation, under the state workmen's compensation law, on the basis of total disability. However, the higher court reversed the verdict, and said:

"We are clearly of the opinion that the proof adduced did not authorize the board to apply the general total permanent disability statute."

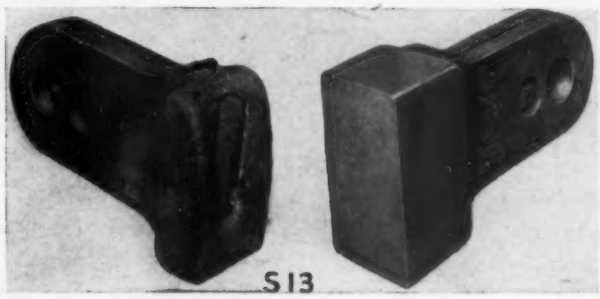
Injuries to Visitors

There are three classifications of persons who enter another's property, namely: invitees, licensees, and trespassers. Considerable discussion has arisen from time to time over the correct answer to the legal question: When and under what circumstances is a private-property owner liable in damages for injuries sustained by a person who comes upon the premises? Modern higher courts hold that the owner of the premises may be liable for failure to warn invitees of dangers or defects on the premises of which the owner knew or of which he should have known in the exercise of ordinary care. This duty to keep the premises safe extends to all places where the invitee may go in the course of pursuing the business or purpose for which the expressed or implied invitation is extended. The owner or occupier of the property must use ordinary care to guard, cover or protect dangerous and defective conditions.

For example, in *Sheffield v. Phillips,* 24 S. E. (2d) 834, it was shown that a man, named Phillips, received personal injuries while engaged in the performance of the duties of his employment and while on the property of another. He was using a door entrance, used by other employees in trucking merchandise into the building and into the basement. This door was generally used by the public as an entrance to the rear of the building. Inside this entrance the company maintained a freight elevator. No signs were at this entrance indicating the existence of the elevator. Phillips was seriously injured when an elevator, without warning, descended, striking and injuring him. He sued the property owner for damages, and alleged that he was negligent in maintaining the elevator at an unsafe location, and in failing to erect and maintain signs notifying the public that this door would lead under the elevator. The higher court agreed with all these contentions and said:

Metal Works Overtime in the Tip of this Pulverizer Hammer . . .

Picture S-13 shows two Amsco-Clark renewable tip pulverizer hammers of original design (patent applied for); one new, the other after long service which has finally worn the tip off, exposing the hooks on the shanks that support the tip.



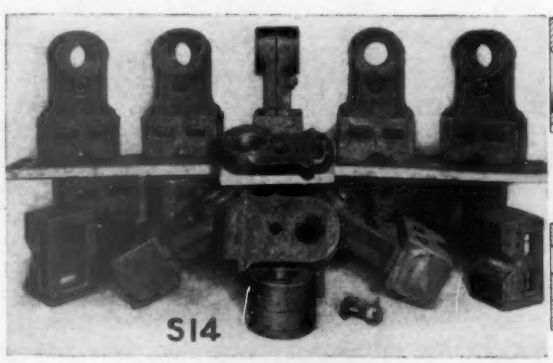
The new complete hammer weighs 110 lbs. (shanks 57½, tip 52½). The worn complete hammer weighs 73½ lbs. (shanks 57, tip 16½). 68.6% of the metal of the tip was worn away before the tip finally had to be replaced. With these manganese steel hammers, two-thirds of the tip is actually used, affording a great saving in discarded metal.

Such performance is possible only when the hammer is made of "the toughest steel known." The terrific impacts involved at high speeds which might fracture ordinary hammers and probably wreck the machine have only the effect of work-hardening austenitic manganese steel hammers and giving them a longer life than any other steel by enhancing wear resistance.

Picture S-14 presents Amsco-Clark pulverizer hammers of an improved design, which is shown in Fig. 5. The reversible tips of these hammers permit practically all the metal to be utilized.

The time required for removing old and replacing new tips in Amsco-Clark hammers is negligible. There is no guessing when tips need changing because the remaining shank-protecting metal is always visible. There is no operating stress on the shank bolt used to hold the assembly together. The tip cannot work or wear loose and come off the shank so long as the shank is on the supporting rotor pin.

Ask for Bulletin 642-C, which describes and pictures many types of Amsco manganese steel pulverizer, crusher and grinding mill parts.



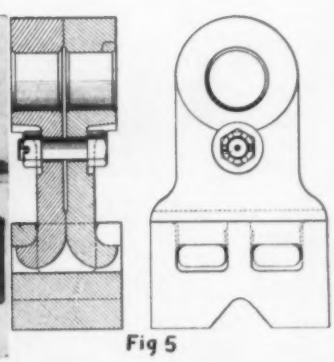


Fig 5

Hammer heads and other pulverizer parts subjected to wear can be restored with Amsco Welding Rods; get bulletin 941-W.

Amsco
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois
AMERICAN Brake Shoe COMPANY
FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

"There is no merit in the contention that the plaintiff was a mere licensee on the premises."

Medical Report Necessary

In *Anderson v. Pyramid Granite Company,* 15 N. W. (2d) 523, it was shown that an employee filed a claim with the Industrial Commission asserting his right to compensation relating to occupational diseases. The Industrial Commission rendered its decision and an appeal was filed to the higher court on the ground that the commission's decision was not based upon medical data. The higher court held:

"The commission's order of reference is not, of course, a final order, and its award or disallowance will not be final until after it has received the report of the medical board to which the reference was made."

Sleepy Truck Driver

In *Myers v. Thomas,* 182 S. W. (2d) 266, it was shown that a motorist was severely injured when he collided with a motor truck being used to haul gravel. The motorist sued the gravel company and alleged that it was liable in damages because its officials employed a driver of the truck at a time when he was tired and sleepy and that the officials were negligent in directing him to work knowing that he was tired and sleepy. However, the motorist failed to prove these contentions. Therefore, the higher court refused to hold the gravel company liable.

Mechanics' Lien Broadened

Modern higher courts hold that a mechanic's lien includes not only the sand and gravel used for improvements but, also, the labor and cost of spreading the materials. For instance, in *Hayward Company v. Ford,* 148 Pac. (2d) 689, it was shown that a company sold sand and gravel to a lessee of real estate to be used in altering and improving a building on the premises and, also, to make a gravel driveway. The lessee failed to pay for the materials and the seller filed a mechanic's lien. The question presented the court was whether the amount of the lien could include the cost of spreading the gravel. In holding in the affirmative, the higher court said:

"The spreading of the gravel could be considered a part of the improvements of the premises and coincided with the alterations and preparation of the premises."

Questions and Answers

[Mr. Parker will be glad to answer questions regarding legal problems of PIT AND QUARRY readers. Questions should be addressed to Leo T. Parker, Legal Editor, PIT AND QUARRY.—Ed.]

Legal Editor: When and under what circumstances is a guarantee or promise made by a salesman of rock crushing equipment valid and binding on the seller?—R. P. C.

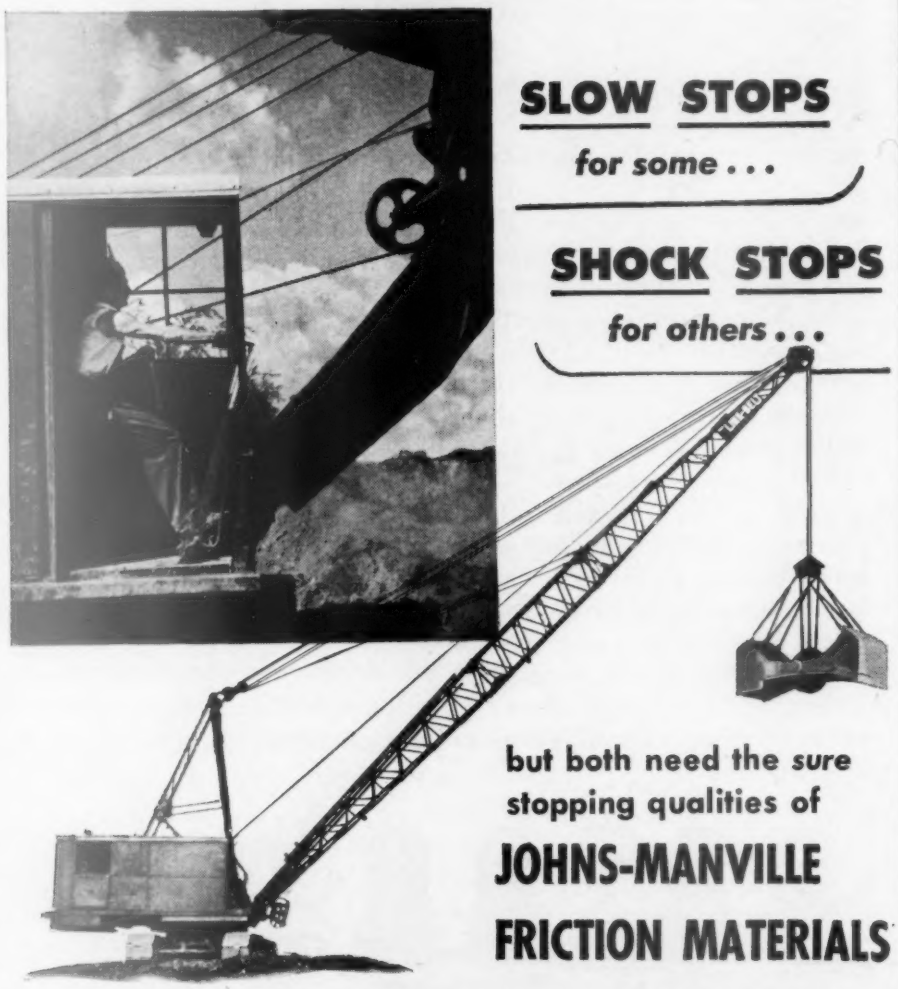
Answer: Generally speaking, statements and promises made by an agent or salesman are admissible, in favor of a purchaser of merchandise, if they were made by the salesman within the scope of his powers or authority given by his employer. In other words, a salesman may complete or vary the terms of a contract of sale, if he has expressed or implied authority to make valid contracts for his employer. Otherwise even a written agreement made by a salesman is void.

For example, in *Frick Company, Inc. v. Smith,* 27 S. E. (2d) 795, reported December, 1943, it was shown that a seller sued a buyer to recover the purchase price of certain machinery. During the trial the purchaser defended the suit on the contention that the machinery did not conform with the guarantee made by the salesman in a letter mailed before the sale contract was signed. Although, the lower court held in favor of the purchaser, since the machinery did not conform with the guarantee specified in the salesman's letter, yet the higher court reversed this verdict, and explained that it was not permissible for the purchaser to prove that the seller's agent made any warranty or representations with respect to the merchandise than contained in the written contract of purchase.

Still another important point of law, involved in this case, relates to implied guarantees. It is well-established law that a seller may be liable on an "implied" guarantee that the merchandise is reasonably suitable for the intended purposes of the buyer provided the seller knew the intended uses of the merchandise and, also, providing the seller did not expressly guarantee the goods. In the above case the testimony proved that in the written contract of sale the seller expressly guaranteed the machinery.

Although the purchaser contended that the machinery was not suitable for his intended purposes, of which the seller was informed, the higher court refused to invoke the "implied" guarantee, saying:

"When a contract contains an express warranty, as the one in the present case does, it is error for the court to charge the jury on the law as to implied warranty."



SLOW STOPS
for some . . .
SHOCK STOPS
for others . . .
but both need the *sure* stopping qualities of
JOHNS-MANVILLE
FRICTION MATERIALS

THE SPEED of a braking-stop may vary. But the necessity that it be *sure* never does.

Whether you ease a brake in for a slow stop, or have to make an emergency stop, you want immediate and reliable action. You get that action from both J-M rigid and flexible Friction Materials. That's why they're so widely regarded as the standard in many fields.

J-M flexible friction materials are used for average and high-speed service, and are adaptable to all sizes of drums. They fit irregular surfaces and need only a short wearing-in period.

The rigid styles have high mechanical strength, exceptional heat resistance, and are quiet in operation. They are designed for low or average speeds and severe shock service, and their wearing-in period is relatively short.

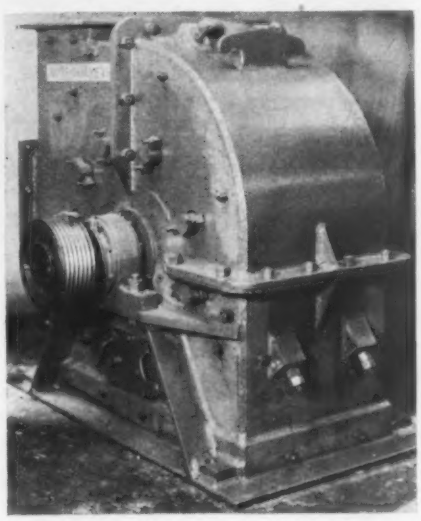
Write for bulletin FM-7A. Address: Johns-Manville, 22 E. 40th St., New York 16, N. Y.

Johns-Manville FRICTION MATERIALS
THERE'S A DISTRIBUTOR NEAR YOU

NEW MACHINERY and SUPPLIES

● Hammer Type Pulverizer

Allis-Chalmers hammer-type Pulverators reduce non-abrasive rock and other similar materials by "multi-impact." Flat hammers rotating at high speed strike the material, which rebounds repeatedly from successively arranged involute breaker plates. "Multi-impact" action disintegrates the material, minimizing wear on grate bars, which are made in seven sizes to reduce up to 10-inch material to fine cubical particles in one operation.



Pulverator with "multi-impact" action.

● Detergent Diesel Oils

Announcement of a new series of Vital Diesel Oils, S. A. E. 10 to 50 inclusive, has been made by E. F. Houghton & Company of Philadelphia. These oils are of the detergent type, embodying highly stable solvent-refined stocks. They are given a special treatment which renders them resistant to oxidation, formation of sludge, and corrosion of bearings.

They conform to U. S. A. Specification 2-104B covering heavy-duty lubricants.

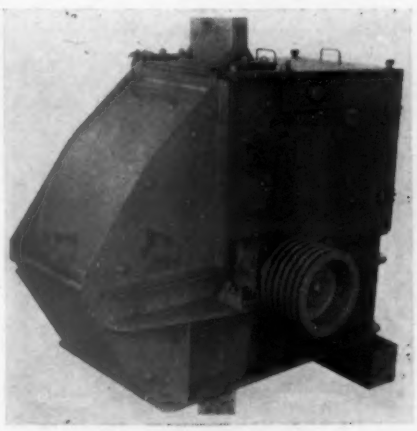
● Special Hoists

Five special hoists and rock-hauling bodies are made by the Gar Wood Industries, Inc., Detroit, Michigan. These are twin-cylinder telescopic hoists (Model T774) and rock bodies (X-112 type) like the one shown in the illustration. The approximate haul is a 12-cubic-yard crown load. The body is constructed of ¼-inch plate throughout, with wood filler and wear plate on the floor.

Twin-cylinder telescopic hoist.

● Impact Crusher

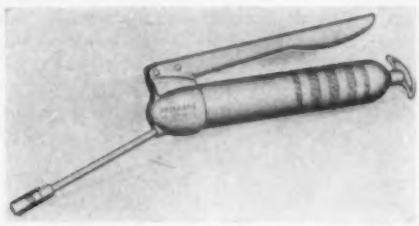
The Nordberg Manufacturing Company, Milwaukee, Wisconsin, presents its Symons impact crusher as a type of machine which makes a more cubical product and also reduces wear and maintenance costs. The impeller of the all-steel crusher consists of a cast steel rotor, to which heavy side discs are bolted. Breaker plates are removable, reversible manganese steel castings. The crusher is made in four sizes, from 26 to 46 inches, with motors from 25 to 150 hp.



Impact crusher makes cubical product.

● New Power Hose

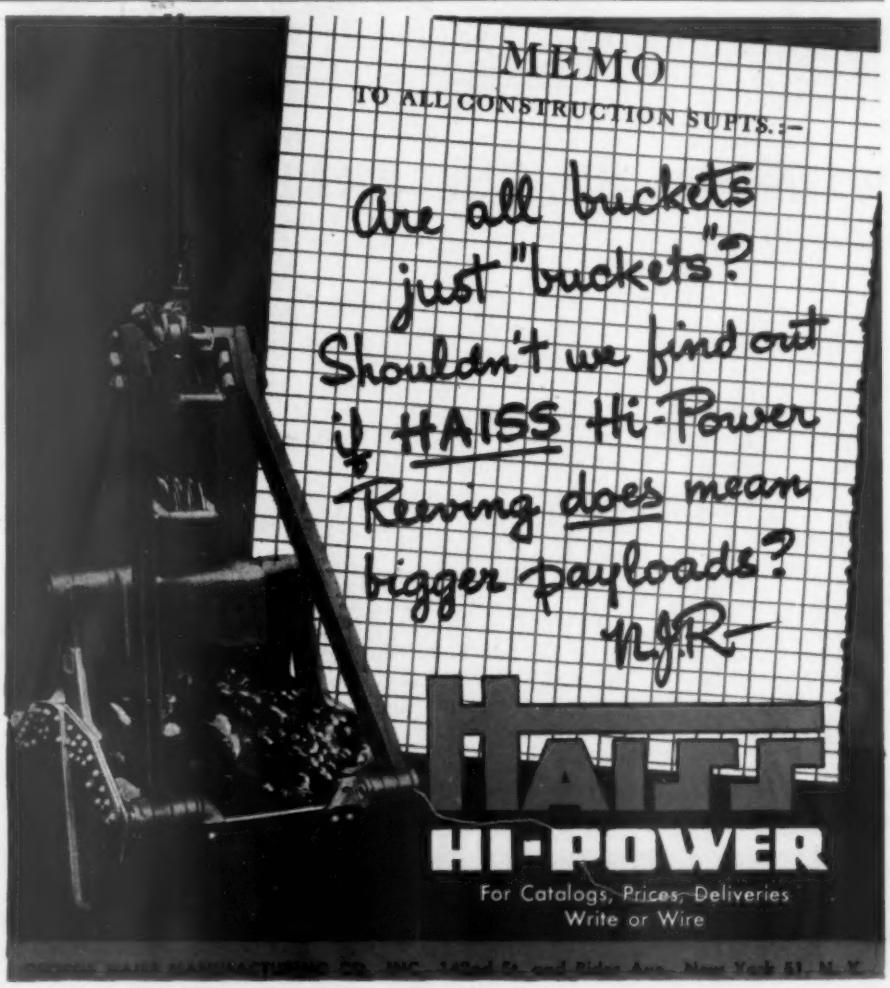
Balcrank, Inc., Cincinnati, Ohio, is making a new Lube-all 162-L power nose which has several distinctive features. A power-grip handle and safety clearance, a knurled barrel and a short-arc handle thrust have been introduced for ease in handling. Its barrel is of cold-rolled, heavy-gage steel, with a tapered thread for easy assembling. The check valve ball and spring are one unit with the power head.



Grease gun.

● Portable Light Unit

Davey Compressor Company of Kent, Ohio, offers its Da-V-Lite portable light and power unit for construction projects, utility emergency repairs, mine operations, logging, quarrying, airfield-lighting and similar purposes. A heavy-duty, four-cylinder, V-type, air-cooled engine operates a Westinghouse single-phase, 60-cycle, 120-volt generator delivering 5 kw. for lighting power. The Da-V-Lite is available in four models — Floodlight, Searchlight, Standard Combination and Beacon. The power unit in all models is enclosed in a sheet-steel, weather-proof body. An illuminated Westinghouse control panel is used.



● Ring-roll Mill

The Type B Junior Hercules developed by the Bradley Pulverizer Company, Allentown, Pennsylvania, is a self-contained unit with an electrically-controlled feeder which grinds ¾ to 1-inch material to any desired fineness in a single operation. Designed expressly for the grinding of agricultural limestone, the Junior Hercules, like its predecessor, the Hercules mill, is of the ring-roll type. The mill can be driven with V-belts or flat belts, by motors or diesel engines or from a line shaft. Gears are contained in a dust-proof housing in the upper crossbar. A separately mounted motor-driven table-type feeder and an electrical feed control are furnished with the mill.

Mill with electric feeder.

● Swing-hammer Pulverizer

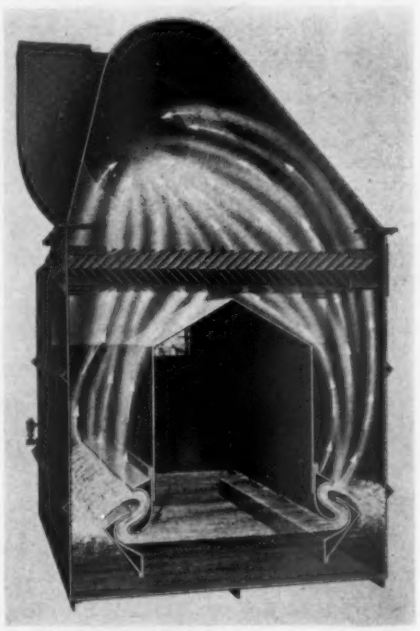
The Type B swing-hammer pulverizer and crusher manufactured by the Jeffrey Manufacturing Company, Columbus, Ohio, features a fine product with low power consumption. The reduction is accomplished through a series of distinct steps, the greater part in the upper chamber. As most of the work has been completed before the material reaches the screen bars, allowing the use of the larger openings for a given size product, a considerable saving of power is effected.

Swing-hammer pulverizer.

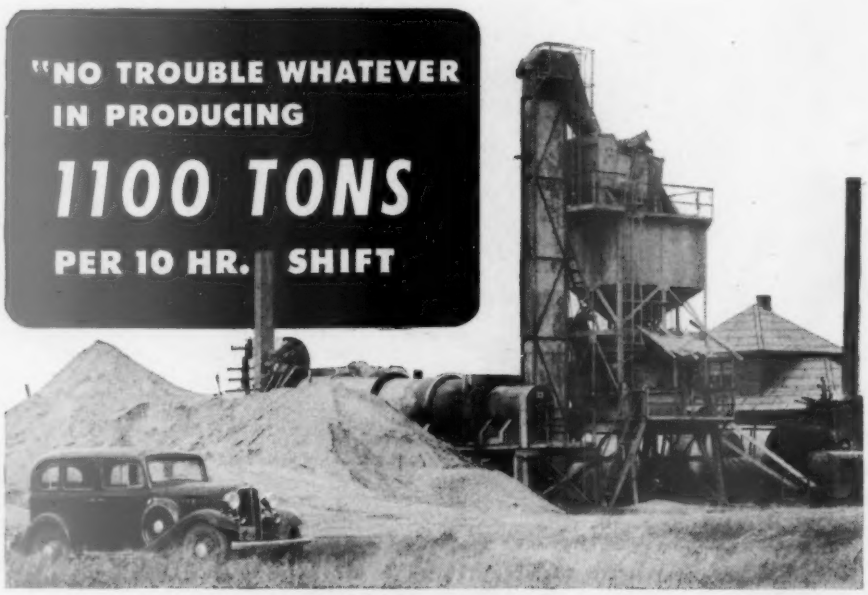
● New Dust Collector

The latest addition to the Roto-Clone series of dust collecting equipment made by the American Air Filter Company, Inc., is Type "N," based on the principle of hydrostatic precipitation. The absence of moving parts aids in the control of magnesium and explosive dusts, keeps linty and adhesive dusts from buffing operations, and absorbs corrosive gases.

The air is cleaned by a combination of centrifugal force and intimate intermixing of water and dust laden air. The air, forced through the sinuous passage of the stationary impeller, induces a heavy sheet of water to move along the surface of the impeller blades, creating a water curtain in the form of a reverse "S" through which the air must penetrate. Collection efficiency is facilitated by the impingement of the dust in water.



Hydrostatic filter.



with our H & B ASPHALT PLANT"

says W. W. King, of King Paving Company, Ltd.

FLUIDOMETER

Automatic Metering System —saves time, materials, insures accuracy and uniformity. For all types of plants.

● Typical of the dependable and efficient operation of Hetherington & Berner Asphalt Plants is the performance record of the Marysville (Ont.) plant of King Paving Co., Ltd., Oakville, Ont. According to Mr. W. W. King, president, this H & B plant has proved 100% satisfactory, and "has come up to—and beyond—our expectations in every way, shape, form and manner."

"We have had no trouble whatever with the plant," says Mr. King, "and no difficulty in producing 1100 tons per 10 hour shift."

This dependable performance is the result of our nearly half a century of experience and recognized leadership in asphalt plant design and construction. America's first builders of such equipment, H & B today offers the latest improvements and refinements in portable and stationary asphalt plants. Write for descriptive literature.

HETHERINGTON & BERNER INC.

715 Kentucky Avenue • Indianapolis 7, Indiana

Hetherington & Berner

● Makes Cubical Material

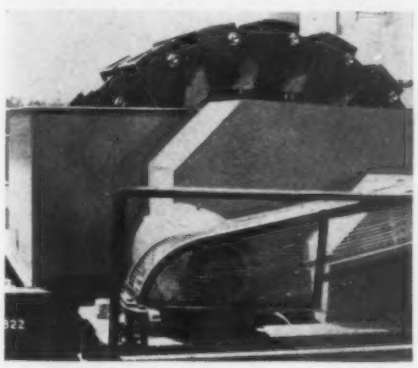
Several new operations have been performed with the D'Centegrator, a machine manufactured by the Simplicity Engineering Company of Durand, Michigan. Designed for the elimination of

Machine of multiple uses.

soft stone particles, the machine recently has been found capable of producing cubical crushed stone particles and of making sand from fine material. It also was used for making agricultural meal at a limestone crushing plant.

● Dewatering Wheel

Stephens - Adamson Manufacturing Company, Aurora, Illinois, have released the following data on the operation of its Buckbee sand dewatering wheel at the Saticoy Rock Company plant near Ventura, California. With a capacity of 75 tons of sand per hour, this wheel in two years has handled approximately 200,000 tons without replacement and with a



Dewatering wheel.

minimum of wear. The perforated bottom of inlet box introduces sand and water into the deep tank with minimum turbulence. The center plate of wheel further reduces surging and, combined with the large settling area, results in quick settling and large-capacity pickup for each dewatering bucket. As a large per cent. of the sand falls directly into buckets, digging is reduced largely to a cleanup operation. The two rows of specially designed buckets around the wheel lift sand from the settling tank. The sand directly over the V-notch in each bucket immediately drops away and allows all excess water on top of the sand and in bucket to flow back into the tank.

● Features Double-arm Lift

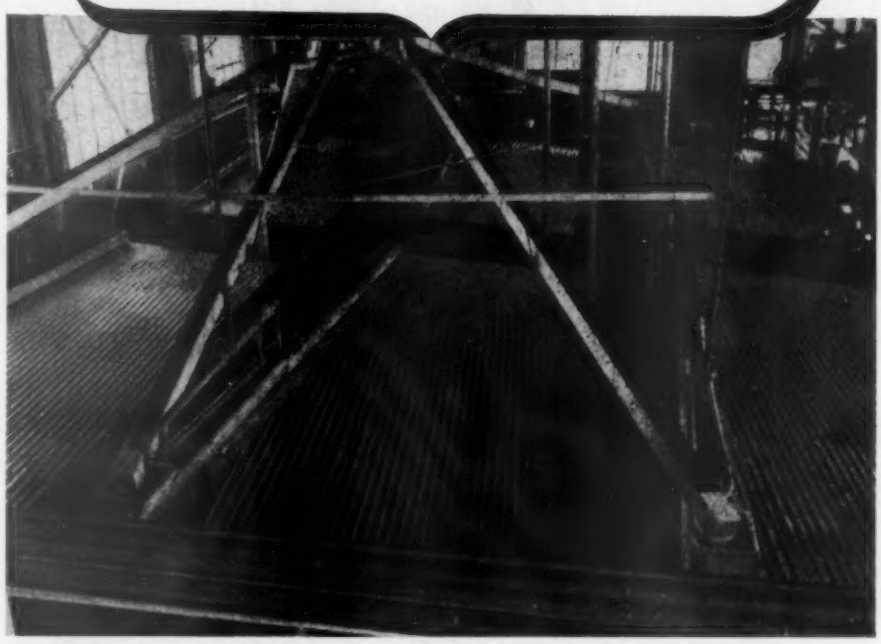
Seven types of hydraulic hoists and dump bodies are being turned out by the Marion Metal Products Company of Marion, Ohio: 621 and 721 for light duty, 626 and 726 for medium duty, HD-7 and HD-8 hydraulic hoist for heavy duty, and HD-10 hydraulic hoist, also for heavy duty.

An outstanding feature of Marion hoists is a double-arm lift with a combination oscillating cylinder and roller-type mechanism which gives maximum efficiency at extremely low oil pressure, insuring durability of the pump and other moving parts. The oil flow is directed through a cast manifold attached to the base of the cylinder, which facilitates changing the pump from the right side to the left. The hoist sub-frame is sturdily constructed as an integral unit and designed to give increased strength at a minimum of weight. The point of support at the base of the cylinder is designed to withstand excessive horizontal and vertical stress.

Eight types of bodies are produced, including trailer dumps and models for tandem truck units.

One of seven types of bodies.

WILFLEY TABLES
for Closer Separation in
PHOSPHATE WASHING



MILLIONS of tons of phosphorus are being produced for American agriculture and for war uses. As in the processing of many other ores where a high grade concentrate is derived from a low grade feed, Wilfley Tables handle high tonnages . . . do the job efficiently and at low cost. The photograph above shows six of the twelve No. 6 Wilfley Tables in a modern Florida phosphate plant.

Inquiries on the use of Wilfley Tables for washing phosphorus will be answered promptly.

Marcy Ball, Rod & Tube Mills; Massco-McCarthy Hot Millers; Rock Bit Grinders; Pinch Valves; Belt Feeders; LABORATORY EQUIPMENT.

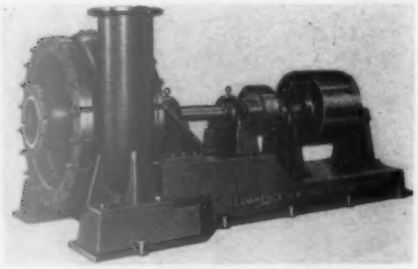
DENVER
SALT LAKE CITY
EL PASO
NEW YORK CITY

The Mine & Smelter Supply Co.

CANADIAN VICKERS, LTD. MONTREAL
W. R. JUDSON SANTIAGO, LIMA

● Dredging Pump

The Lawrence Machine and Pump Corporation, Lawrence, Massachusetts,

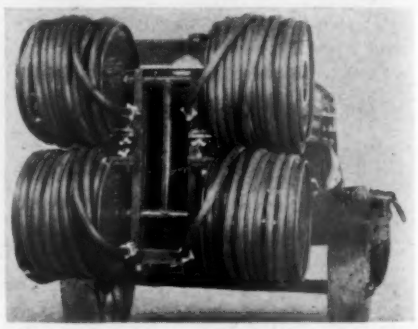


Pump for oyster shells.

have developed a pump for dredging oyster shells off the Gulf Coast. To permit of maximum flexibility and also of the most efficient and economical design it was decided to drive the pump by belt instead of connecting it direct to the Diesel engine. The pump is made with 14" suction and 12" discharge and is designed to deliver 285 cu. yds. of oyster shells and mud against a total head of 40' at a speed of 330 rpm. The power required under these conditions is 120 Br. hp. The parts are of special hard semi-steel, capable of resisting both the abrasive wear and the shocks and pounding which are incidental in this class of service. They are of simple design and easily renewable. The side discs or heads are fastened to the pump casing with slotted flanges. The impeller is secured to the shaft with a tapered fit. The bearings are heavy duty, self aligning roller bearings, sealed against dirt and water. Clearances thru the pump are sufficient to pass thru solids up to 9" in diameter. A feature deserving particular attention is the arrangement of the drive pulley which is mounted on a separate shaft and carried in independent steady bearings. The drive shaft is connected to the pump shaft thru a flexible coupling. With this arrangement the pump can be dismantled without disturbing the drive.

● Portable Hose Reel

A portable four-hose reel featured by Schramm, Inc., West Chester, Pennsylvania, may be used on any portable compressor. It fits in any 1½-inch fe-

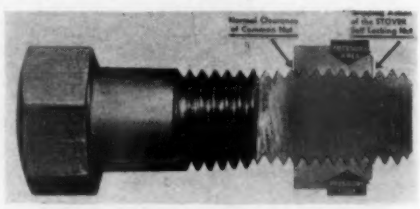


Compressor hose reel.

male pipe connection in the end of an air tank or in a horizontal outlet in a pipeline. A built-in valve controls the air in the entire length of the hose. The side members are ⅛-inch steel spinnings welded to the drum.

● Self-locking Nut

Stover Lock Nut and Machinery Corporation of Easton, Pennsylvania, has put out a self-locking nut which acts like a powerful spring. It clutches the bolt so firmly that it cannot shake loose,

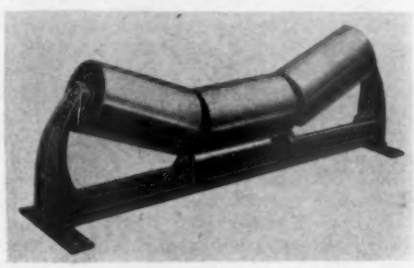


Self-locking nut.

even under maximum vibration. To obtain this effect, the upper part of the threaded portion is slightly elliptical, while the lower part remains circular. After the threads have been securely screwed on the bolt, the nut is self-locked, because of the gripping action of the tapered section.

● Anti-friction Idler

The "100" Link-Belt anti-friction idler for belt conveyors was announced recently by the Link-Belt Company of Chi-



Anti-friction idler.

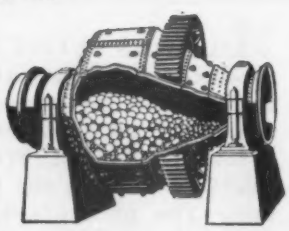
cago as available in various sizes and types. Among the features of the new idler are a grease seal to prevent the entrance of grease and dirt; troughing

AGRICULTURAL LIMESTONE

Produced with

- Ruggles-Coles Rotary Dryers
- Hardinge Conical Mills
- Reversed Current Air Classifiers
- Constant Weight Feeders
- "Electric Ear"* Sound Control Units

For economical production of agstone Hardinge equipment is unsurpassed. All equipment is designed to meet your specific requirements. If the stone contains high moisture, the Counter-Flow Rotary Dryer should be used prior to grinding and classifying. For low moisture content, the Hardinge Thermomill, which dries, pulverizes, and classifies in one operation, is recommended. The Weight Recording Feeder indicates the feed rate and totalizes the weight fed. The "Electric Ear" automatically controls the feed rate and maintains maximum capacity of the grinding unit.



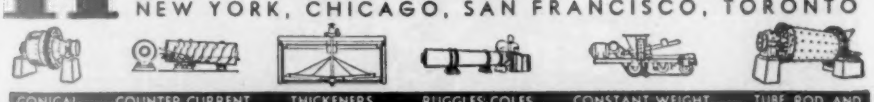
*Reg. U. S. Pat. Office

Write for Bulletins

HARDINGE

COMPANY, INCORPORATED - YORK, PENNSYLVANIA

NEW YORK, CHICAGO, SAN FRANCISCO, TORONTO

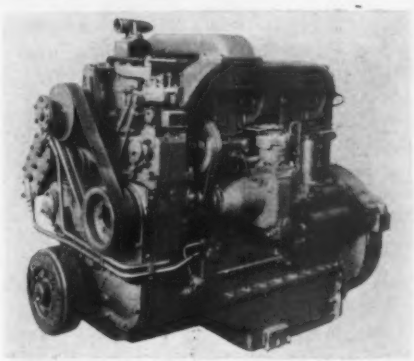


CONICAL MILLS | COUNTER CURRENT CLASSIFIERS | THICKENERS CLARIFIERS | RUGGLES-COLES DRYERS | CONSTANT WEIGHT FEEDERS | TUBE ROD AND BATCH MILLS

rolls aligned to assure correct bracket spacing and roll interchangeability; interlocking nuts and yokes to prevent spreading of brackets; pipe extensions for center-roll lubrication from one end of the troughing idler unit; identical and interchangeable rolls.

● High-Speed Diesel Engines

The Cummins Engine Company, Inc., Columbus, Indiana, recently announced a new series of high-speed Diesel engines for automotive use. Several of the new models already have been in-



New Diesel automotive engine.

stalled on 20- and 30-ton dump trucks in open-pit operations in the United States and in Canada. Alterations in design have resulted in additional power with but minor changes in weight or size.

• A Model 4 Athey MobiLoader working in a gravel pit in Arkansas. Here the material consisted of 20 per cent. clay and 80 per cent. gravel running about ⅛ to 1½-inch in size. The average size load is 4 cubic yards. Loading time per truck on this job ran slightly under two minutes.

● Tagline

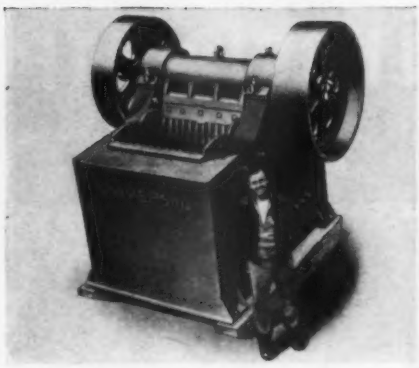
The McCaffray-Ruddock Tagline Corporation, Los Angeles, have introduced a tagline — the Rud-O-Matic — which the

Tagline operates on spring principle.

manufacturer claims greatly aids the operation of a clam-shell crane. The company is able to supply these necessary accessories for replacement or initial installation on any unit. Operated on a spring principle, the tagline maintains a positive tension sufficient to steady a clam-shell bucket under any conditions and with the boom at any angle. There are no weights, tracks, carriages, or pins to wear out or get out of order. Because of the large bearing and the use of fewer sheaves, cable wear is reduced to the minimum. The tagline can be installed at any suitable point on the crane, the easiest place being on the bottom, preferably between the upper and lower angles, with the drum away from the operator. It may also be installed on the gantry frame in the cab of some models. It is supplied complete with fair lead and cable attached and can be installed in less than 30 minutes.

● Jaw Crusher

Universal Engineering Corporation of Cedar Rapids, Iowa, announces its new welded-steel-plate roller-bearing jaw crusher, series W.R.B. The crusher is for primary crushing of limestone. The feed opening is 30 by 42 inches.



Primary limestone crusher.

See this "N-H"

DOUBLE IMPELLER CRUSHER

Operates on a New Basic Principle

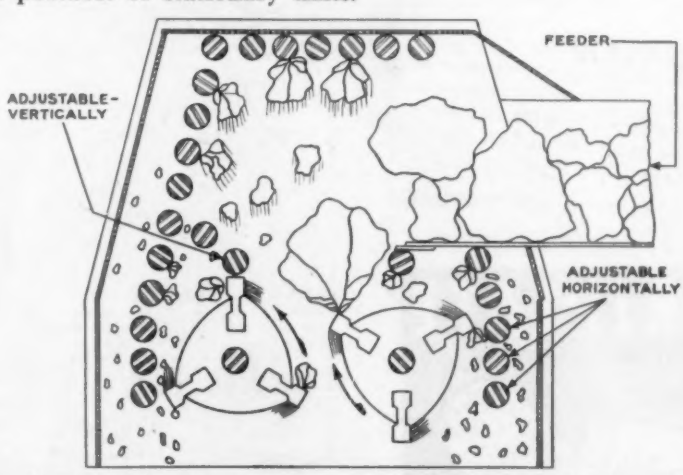
Model 3030 operating in limestone quarry owned by D. M. Stoltzfurs & Sons Co., Quarryville, Pa.

Reduces run-of-the-quarry material as large as thirty inches to an optional minimum of eighty percent under one inch in one operation.

Handles 100 to 150 tons per hour with as little as 100 horsepower.

Combines expensive primary and secondary machinery in one operation.

For portable or stationary units.



New Holland Line includes Conveyors, Elevators, Roll Crushers, Impact type Hammer Crushers, Limestone Pulverizers, Revolving Screens, Vibrating Screens.

NEW HOLLAND NH MACHINE CO.
NEW HOLLAND, PENNSYLVANIA

LUBRIPLATE No. 105

This very smooth, light density (semi-fluid) grease type lubricant resists water and other unfavorable operating conditions to a marked degree. LUBRIPLATE No. 105 not only provides superior lubrication but offers utmost protection against rust and corrosion. Because of its water-proof feature and freedom from "drag", it is ideal for

General Industry	Firearms
Radio Equipment	Outboard Motors
Instruments	Home Appliances
Business Machines	Fishing Reels

LUBRIPLATE Lubricants definitely reduce friction and wear to a minimum. They lower power costs and prolong the life of equipment to an infinitely greater degree. LUBRIPLATE arrests progressive wear.

LUBRIPLATE Lubricants protect machine parts against the destructive action of rust and corrosion. This feature alone puts LUBRIPLATE far out in front of conventional lubricants.

LUBRIPLATE Lubricants are extremely economical for reason that they possess very long life and "stay-put" properties. A little LUBRIPLATE goes a long way.

Write for a booklet, "The LUBRIPLATE Film", written especially for your industry.

LUBRIPLATE

FISKE BROTHERS REFINING CO.

NEWARK 5, N. J.
TOLEDO 3, OHIO

TRADE NOTES

Guy F. Rolland

Guy F. Rolland has been appointed director of Reynolds Experimental Laboratory, the explosives research facilities of Atlas Powder Company, near Tamaqua, Pennsylvania.

Mr. Rolland, who came to Atlas in a research capacity in 1927, has specialized in electric blasting cap and blasting cap research and in the study of customer problems.

Hobart C. Ramsey, newly elected executive vice-president of Worthington Pump and Machinery Corporation, Harrison, New Jersey, has been with the firm for the last 25 years. Before assuming his present office, Mr. Ramsey was vice-president in charge of operations.

E. J. Schwanhausser, formerly vice-president in charge of the Buffalo works, who was recently appointed vice-president in charge of sales, with offices at Harrison, has been with the company for 32 years.

Eimco Corporation of Salt Lake City, Utah, recently announced the opening of its new office in St. Louis, Missouri, with James K. Russell as manager.

Amedee H. Smith

Amedee H. Smith, pioneer west coast industrialist, died March 25 in Portland, Oregon. Mr. Smith was chairman of the board of directors of the Hyster Company, president of the Willamette Iron & Steel Company, a director of Portland General Electric Company and president of the Oregon Paramount Corporation. He was one of the formulators of the Oregon Workmen's Compensation Act.

The appointment of Harry Bernard as director of service and service engineering was recently announced by C. T. Ruhf, president of Mack Trucks, Inc. Mr. Bernard joined Mack in 1924 and prior to his present appointment had been general service manager. He will make his headquarters in Mack's Long Island City plant.

Stephen M. Birch, since 1938 advertising manager of the Texas Company, died April 10 in a New York hospital. A native of Robinson, Illinois, Mr. Birch served in World War I as a second lieutenant of ordnance. He became associated with the Texas Company in 1929.

F. L. Smidth & Company, manufacturers of cement-making machinery, have moved their offices from 60 East 42nd Street to 11 West 42nd Street, New York City.

For Non-stop Production Programs

Brooks LOAD LUGGER

Use 5 to 10 dump buckets with each Load Lugger to get maximum results.

Speed up your earth moving and construction jobs with the Brooks *economy system* of material handling. By equipping your trucks with LOAD LUGGERS, you can load, haul and dump in a continuous operation. It's faster and more efficient than ordinary trucks, especially on hand loading jobs . . . for excavating, road building, stripping overburden, quarry operations, hauling supplies, snow removal, etc. Write for Catalog No. 44 . . . also ask about the TrucKrane boom attachment for special jobs.

105 Davenport Road Knoxville 8, Tenn.
DISTRIBUTORS IN ALL PRINCIPAL CITIES

Brooks EQUIPMENT AND MFG. CO.

J. H. Buchanan

James H. Buchanan has been named manager of the newly created Chicago district sales office of Atlas Powder Company's explosives department, it was announced on April 1. The new Chicago district will include the states of Illinois, Wisconsin, Minnesota, and most of Indiana. The offices will be in the Field Building, 135 South LaSalle Street, Chicago 3.

Mr. Buchanan has represented Atlas in Chicago since 1938. From 1930 to 1938 he had served as Atlas representative in Mexico.

H. K. Porter Company, Inc., announces the election of S. B. Heppenstall, Jr., as vice-president. He will make his headquarters in the general offices of the Porter company in Pittsburgh. Mr. Heppenstall was formerly vice-president in charge of sales of the Heppenstall Company.

Socony-Vacuum Oil Company, Inc., recently announced that Herbert Willetts had been appointed assistant general manager of eastern marketing.

Fred G. Nunneley, Canadian sales manager of Caterpillar Tractor Company, Peoria, Illinois, since 1935, has resigned his position to become general manager of the Powell Equipment Company, Ltd., of Winnipeg, Canada.

G. J. Brown, manager of the London office of Nordberg Process Machinery Company of New York City, recently visited the firm's plant at Milwaukee. After having been "loaned" to the British Ministry of Supply for the last five years, Mr. Brown will return to his post in London. Before joining Nordberg in 1929 he was works manager of a large British heavy engineering firm.

H. S. McPherson of St. Louis has been appointed midwestern sales manager of the mechanical goods division of the United States Rubber Company and

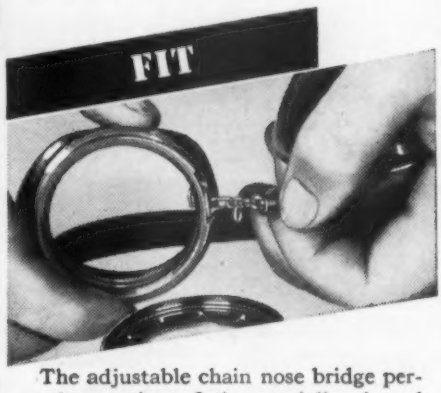
H. S. McPherson

W. M. Ballew

W. M. Ballew of Kansas City, Mo., has been shifted to the post of southwestern sales manager, according to an announcement by H. A. Everlien, general sales manager.

William M. Gardella, veteran sales engineer with Oliver United Filters, Inc., Hazelton, Pennsylvania, who specialized in filtration and clarification problems, died recently at Springfield, Ohio.

Model RR50, one of more than 20 Willson Cup Goggles, meets Federal specifications for worker eye protection in chipping, grinding, riveting, sledging, snagging. The thick Super-Tough lenses of heat treated glass have high frontal impact strength. Reinforced plastic eye cups give side protection.



The adjustable chain nose bridge permits spacing of the specially shaped eye cups for proper fit. Adjustable headband holds cups snugly against the face. No pressure on nose, no high spot pressure on face when properly adjusted.

Smooth plastic eye cups with rolled edges are specially shaped to left and right eye socket contours so they always feel comfortable. Direct or indirect cup ventilation and lens ventilation assure seeing comfort and minimize lens fogging.

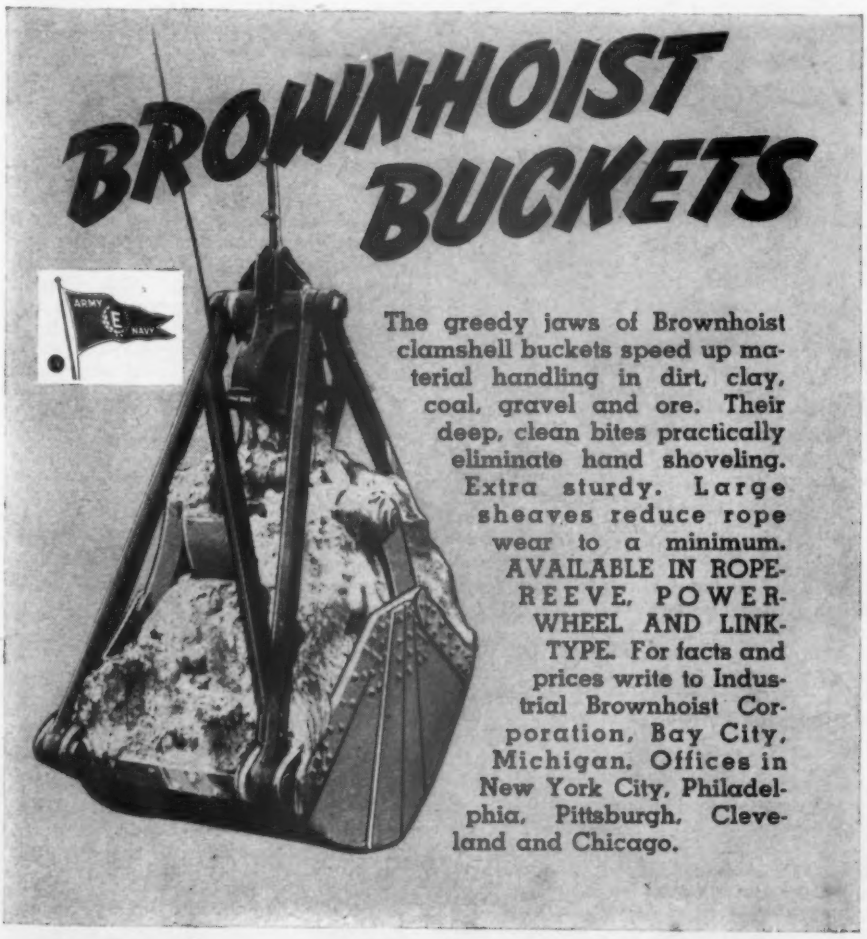
For help on eye protection problems, consult your Willson distributor, or write department PQ-9.

GOGGLES • RESPIRATORS • GAS MASKS • HELMETS

DOUBLE WILLSON

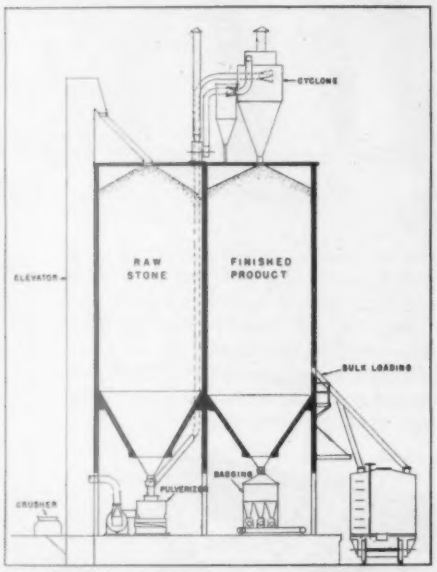
PRODUCTS INCORPORATED

READING, PA., U.S.A. Established 1870



The greedy jaws of Brownhoist clamshell buckets speed up material handling in dirt, clay, coal, gravel and ore. Their deep, clean bites practically eliminate hand shoveling. Extra sturdy. Large sheaves reduce rope wear to a minimum. AVAILABLE IN ROPE-REEVE, POWER-WHEEL AND LINK-TYPE. For facts and prices write to Industrial Brownhoist Corporation, Bay City, Michigan. Offices in New York City, Philadelphia, Pittsburgh, Cleveland and Chicago.

INCREASE PROFITS WITH NICHOLSON BINS



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FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants. Engineering Service.

EARLE C. BACON, Inc.

17 John St. New York, N. Y.

A. G. Bussmann's election as vice-president in charge of sales was announced by E. P. Holder, president of Wickwire Spencer Steel Company of New York City.

Currently the company is planning greatly expanded postwar sales activities.

A. G. Bussmann

In his new position Mr. Bussmann will have complete charge of all sales and merchandising operations of Wickwire Spencer and the company's subsidiaries.

Mr. Bussmann previously was assistant to the president of Wickwire Spencer. He has been associated with the company since 1930 and was successively manager of the wire and springs divisions, sales manager of the Buffalo District, general sales manager and assistant to the executive president.

The appointment of F. S. Elfred, Jr., as general manager of the explosives division of Olin Industries, Inc., and its subsidiaries (Western Powder Manufacturing Company, Peoria, Illinois, and the Liberty Powder Company, Pittsburgh), was announced by John M. Olin, president.

Mr. Elfred also will assume the duties of general manager of the Equitable Powder Manufacturing Company, East Alton, Illinois, and its affiliates, the Columbia Powder Company of Tacoma, Washington; the Egyptian Powder Company of Pollard, Illinois; and the Texas Powder Company of Dallas. Producers of explosives for the war effort, some of these plants now are manufacturing such products for the quarrying industries, and for coal and metal mining.

Other appointments announced in the Olin explosives division include the following: R. R. Casteel, secretary; John Caruthers, assistant secretary; and E. J. Krupp, assistant treasurer.

Manhattan Victory Gardens, the 400-garden project that won the highest award of the National Victory Garden Institute for the past two years, is now under way for the 1945 season, according to officials of the Manhattan Rubber Manufacturing division of Raybestos-Manhattan, Inc., Passaic, New Jersey.

James J. De Mario, chairman of the garden committee and advertising manager of Manhattan, said that the gardeners were already at work. In view of a food shortage that may be worse than last year's, it is expected that the gardeners will better their record of the past two years. The land for the 10½ acre project is leased by the company and is divided into plots approximately 20 by 40 feet. Fertilizer, water, tools with an attendant, and a parking lot are provided by the company. The gardeners work the plots at all hours, usually going there on the way to and after coming off different shifts. The project, worked enthusiastically by Manhattan employees, has resulted in offsetting the shortage of fresh vegetables among employees' families.

Directors of American Brake Shoe Company have appointed T. W. Pettus president of National Bearing division, and William B. Given, Jr., president of Brake Shoe. Mr. Pettus has been executive vice-president of the National Bearing Metals Corporation, until recently a subsidiary of the parent company.

J. E. Dedman, Jr., who has been assistant manager of the export section of Atlas Powder Company's explosives department since August, 1943, on April 2 was named export manager, and John V. Kelly was appointed special representative, export section.

At the annual meeting of the stockholders of the Shafer Bearing Corporation held in Chicago on February 8, 1945, the following officers and directors were elected: Ray P. Tennes, president; J. F. Ditzell, executive vice-president and general manager; M. J. Tennes, Jr., vice president; A. H. Williams, vice-president in charge of engineering; I. B. Lipson, secretary; A. L. Gray, assistant secretary and treasurer; and E. H. Ferguson, assistant treasurer.

The appointment of W. R. Persons as assistant sales manager has been announced by J. F. Lincoln, president of The Lincoln Electric Company, Cleveland, Ohio. In his promotion to this new post, Mr. Persons will act as assistant to C. M. Taylor, vice-president and general sales manager.

Sales, advertising and service department offices of the Stewart-Warner Corporation are again located at the corporation's main plant, 1826 Diversey Parkway, Chicago. Removal from temporary war-time quarters in the Builders' Building, 228 North LaSalle Street, to a newly converted general office building at the Diversey address, was completed recently.

L. F. Campbell has been named vice president in charge of manufacturing of the precision gear division; E. A. Johnson, assistant vice president in the industrial gear division; I. C. McVicar, assistant secretary; and L. J. Malina, assistant treasurer of Foote Bros. Gear and Machine Corporation.

Two new appointments were recently announced by the Western Machinery Company of San Francisco: S. R. Bousman as manager of the development department, and A. J. Saarinen as chief mechanical engineer.

Dale Higgins, Pittsburg, Kansas, representative for the Marion Steam Shovel Company, died recently at his home in Pittsburg.

M. E. Montrose

At the annual meeting of directors of the Marion Steam Shovel Company, held recently at Marion, Ohio, Maynard E. Montrose was elected president and general manager. Mr. Montrose, who formerly was executive vice-president of the Lane-Wells Company, Los Angeles, also had been affiliated with the General Electric Company for 13 years. Also elected were the following: J. M. Strelitz, chairman of the board and general counsel; Alec Gibson, vice-president and treasurer; J. P. Courtright, vice-president in charge of sales.

The Lima Locomotive Works, Inc., of Lima, Ohio, recently announced the appointments of seven new distributors for Lima shovels, draglines and cranes: McLean-Sims Machinery Company, Palatka, Florida; State Machinery & Supply Company, Columbia, South Carolina; G. C. Phillips Tractor Company, Birmingham, Alabama; Martin Machinery and Supply Company, Knoxville, Tennessee; Modern Machinery Company, Inc., Spokane, Washington; West Virginia Mine Supply Company, Clarksburg, West Virginia, and Chicago Construction Equipment Company, Chicago, Illinois.

S. L. Myers

S. L. Myers, formerly vice-president in charge of export sales for LaPlant-Choate Manufacturing Company, Inc. of Cedar Rapids, Iowa, has been appointed vice-president and general sales manager, succeeding H. H. Buchanan, who resigned.

Mr. Myers has served LaPlant-Choate in various capacities for over 22 years. After working in the shop, he served as traffic manager, purchasing agent, and export sales manager, in addition to being responsible for government sales.

C. F. Larsen has been appointed manager of the service department of Mack Trucks, Inc. Mr. Larsen joined Mack in 1920 and had been in charge of the firm's parts-pricing department. Also announced was the appointment of John Walker, formerly assistant to the chief engineer of the special equipment department, as sales engineering department manager.

S. H. Bridges has been named manager of Mack's Poughkeepsie, New York, branch, replacing H. L. Weatherwax, who resigned. The new manager of the Utica branch is G. L. Murphy. R. J. Meinert has returned to Mack as manager of national account sales in the Central Division, with headquarters in Chicago. During the last two years Mr. Meinert had served as an assistant automotive advisor with the Sixth Armored Force at Camp Chaffee, Arkansas.

PERFORATED METAL SCREENS
FOR SAND, GRAVEL STONE, ETC.
Manufactured exactly to your specifications.
Any size or style screen, in thickness of steel wanted with any size perforation desired.
We can promptly duplicate your present screens at lowest prices.
Prompt shipment
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Types of Projects Solicited
SILOS — "Sliding Form" Method
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Industrial or Commercial
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YOU CAN PROFIT BY OUR TWENTY-FIVE YEARS EXPERIENCE
Our engineers and construction crews are available for quick construction.
E. C. MACHIN COMPANY
BUILDERS
Commonwealth Building — Allentown, Pa.

ROD BABBITTING
Another Plant Controlled Operation on all
WISCONSIN Air-Cooled ENGINES

There's more to babbitting connecting rod bearings than simply applying the metal. Not only must the work be expertly done, but it is important that frequent detailed chemical analyses be made of materials in order to provide a dependable safeguard against inferior quality bearing metal, and to assure constant uniformity.

Wisconsin Engine connecting rod bearings are babbitted in our own plant, under our own complete control. A careful check is maintained to make sure that the metal is always what it *should* be and that it is applied *the way it should be*. This helps to make a better engine . . . designed to give better service on your equipment.

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World's Largest Builders of Heavy-Duty Air-Cooled Engines

The Spotlight IS ON

THE GILSON MECHANICAL TESTING SCREEN

The compact, ingeniously designed GILSON TESTING SCREEN assures a controlled product guaranteed to meet specifications. Test samples of crushed stone, gravel, slag, etc. are carefully sized through five test screens by a smooth and quiet vibration, separating 100 pounds of sample in 5 minutes or less. Eliminate errors that happen through "sizing by guess"—write today for complete information on the GILSON TESTING SCREEN.

THE GILSON SCREEN CO.
P. O. BOX 186 MERCER, PA.

Trade Literature

The pieces of literature listed below can be obtained direct from the manufacturers named, or requests can be addressed to Pit and Quarry's "Service to Readers" Department.

ARC WELDING ELECTRODES. 16 pages. Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin.

FULLER DRY PULVERIZED-MATERIAL COOLER. (Bulletin PMC-1), 8 pages. Fuller Company, Catasauqua, Pennsylvania.

PRODUCTION WITH REAR DUMP EUCLIDS. 24 pages. Illustrated story showing Euclids in action on various types of jobs in this country and Europe. The Euclid Road Machinery Company, Cleveland.

BOTTOM DUMP EUCLIDS ON THE MOVE. 28 pages. Illustrations show various earth moving jobs being done. The Euclid Road Machinery Company, Cleveland.

SPECIAL CONSTRUCTION EQUIPMENT. 26 pages. Bulletin 260. This company's line of plants for the concrete, cement, sand and gravel, and concrete products field and other industrial installations, are presented pictorially. A minimum of explanatory text accompanies the photographs. This bulletin and 14 others giving detailed information are available from Butler Bin Company, Waukesha, Wis.

MIKRO-PULVERIZER. 40 pages, loose-leaf booklet. Pulverizing Machinery Company, Summit, N. J.

TANK TYPE LOCOMOTIVES. 22 pages. Bulletin A-394. Devoted to Saddle and Side-Tank Locomotives for plantation and general industrial service. Vulcan Iron Works, Wilkes-Barre, Penna.

V-BELT HANDBOOK FOR INDUSTRIAL APPLICATIONS. 74 pages. Contains data on operating, installation and selection of the V-drive, and general information covering the whole field. B. F. Goodrich Company, Akron.

METAL AND NON-METALLIC INDUSTRIES. 16 pages. Bulletin B-61660. Gives a quick overall picture, amply illustrated, of design, operating principle, and field experience of products for the crushing, mining and processing fields. Allis-Chalmers Manufacturing Company, Milwaukee.

SAFETY RULES FOR OPERATORS OF POWER INDUSTRIAL TRUCKS. 4 pages. The Elwell-Parker Electric Company, Cleveland.

PUNCH-LOK METHOD FOR BANDING AND SPLICING. 6 pages. B. F. Goodrich Company, Akron.

THE WAR TESTED DIFFERENTIAL FOR TRUCKS. Thornton Tandem Company, Detroit.

OPERATORS HANDBOOK. 96 pages. Gives vital facts and data about tires, rims and wheels. B. F. Goodrich Company, Akron.

MODERN PRECISION. 28 pages. A general catalog describing instruments for regulating plant processes. Leeds and Northrup Company, Philadelphia.

DENVER STEEL HEAD BALL-ROD MILLS. 32 pages. Bulletin No. B2-B4. Denver Equipment Company, Denver, Colorado. Contains slide rule.

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Shovel Dippers
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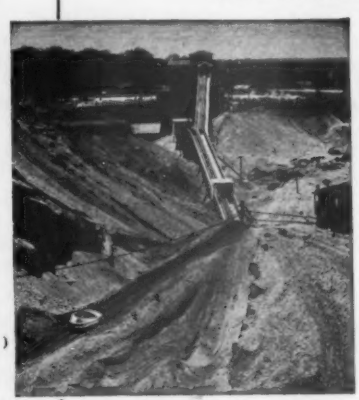

Explanation of Picture—

Above is a Sauerman Crescent Scraper cutting deep into hill and hauling gravel to crusher. Bucket is pulled to rear of cut, gathers a heaping load, and carries load to hopper in a little over a minute; then dumps instantaneously into hopper. Simple and sure and cheap.

Write for Catalog

AT gravel and stone crushing plants, in strip mines and wherever there are problems of stockpiling or excavating, Sauerman Crescent scraper buckets daily demonstrate their ability to dig and deliver large tonnages of materials at costs of a few cents a ton.

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Ranging rapidly over a large area, loading and dumping automatically, a Crescent Scraper, operated by a Sauerman improved hoist, is the most productive one-man machine for digging and hauling.

SAUERMAN BROS., Inc.
534 S. Clinton St. Chicago, Illinois

87% Cut in Power Costs

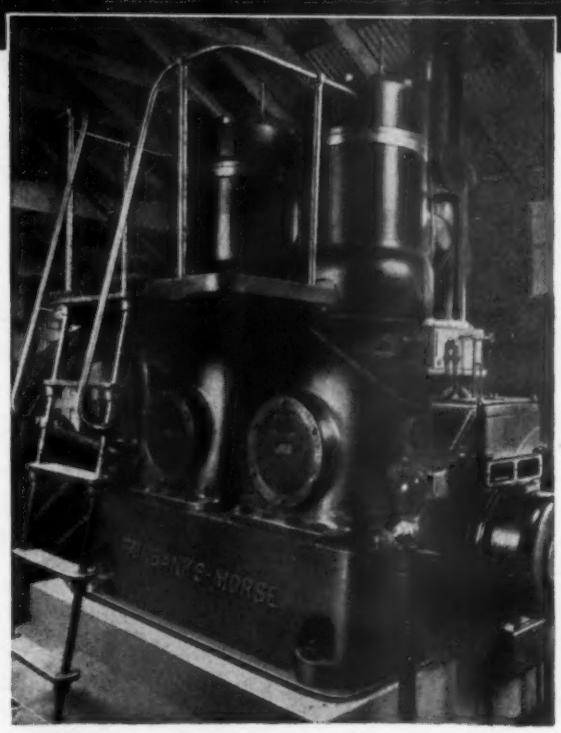
That's Record for One Sand & Gravel Co.

SEVERAL years experience in paying $350 a month in fuel and lubricating oil costs was enough for the W. B. Stocker Co.

They decided to try a Fairbanks-Morse Diesel. That Diesel—a 2 cylinder, 150 hp.—now furnishes current for the complete plant at $43 a month for fuel and lube oil. The saving is approximately 87%.

In addition to such a saving, the W. B. Stocker Sand & Gravel Co. has eliminated major difficulties in maintenance, operating delays, and breakdowns. Needless to say they're firm believers in Fairbanks-Morse Diesels for economical, dependable power.

There's a Fairbanks-Morse Diesel that will do your job just as well. You can get the complete story. Write Fairbanks, Morse & Co., Fairbanks-Morse Building, Chicago 5, Illinois.



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A name worth remembering

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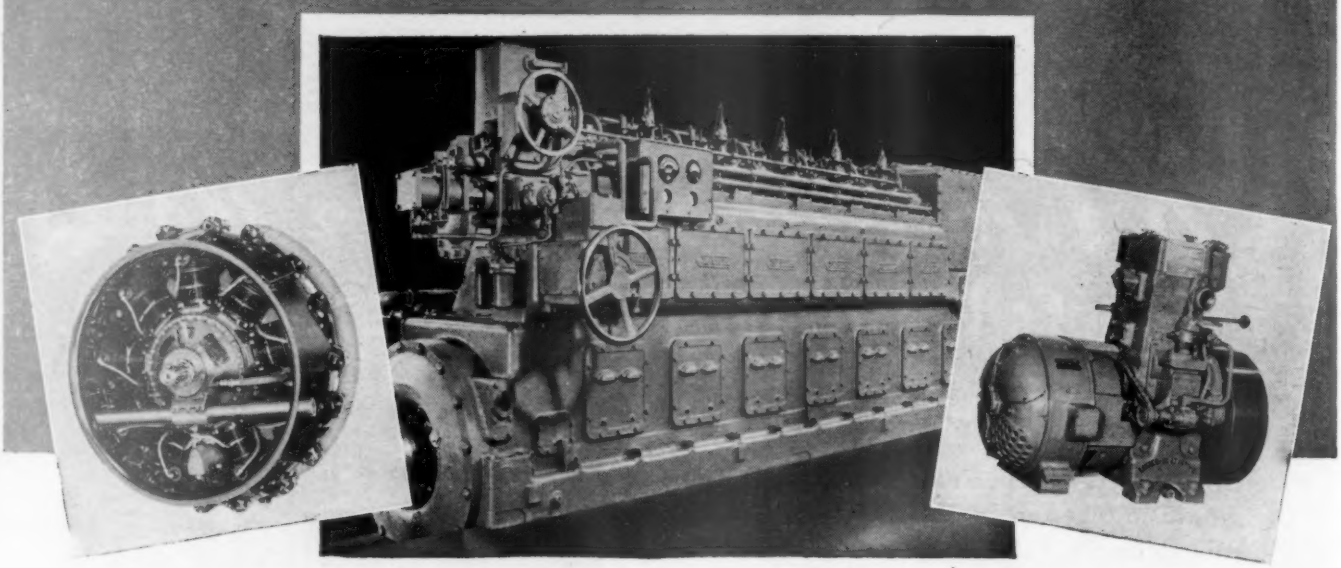
PORUS-KROME

undercover. . but unequaled



PORUS-KROME has nothing to hide . . . even though it is always undercover and out of sight. Its records for increasing the life of cylinders and liners are still unequaled, and the results are comparable in every type of heavy-duty engine . . . big marine Diesel, radial aircraft engine, or even small auxiliary power plants.

PORUS-KROME is hard, pure chromium which is applied to cylinder bores by the Van der Horst process. It has tiny pores and channels in its surface which serve as reservoirs for lubricating oil, feeding it back as needed. It reduces corrosion and wear, and multiplies cylinder life 4 to 20 times . . . ring life 3 to 5 times.

Although the Army and Navy now absorb the entire production of its three plants, Van der Horst is eager to plan with engine manufacturers for postwar use of PORUS-KROME. Write today for full information about the advantages of greater reliability and lower maintenance cost that PORUS-KROME will give to your engines.

PORUS - KROME

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VAN DER HORST

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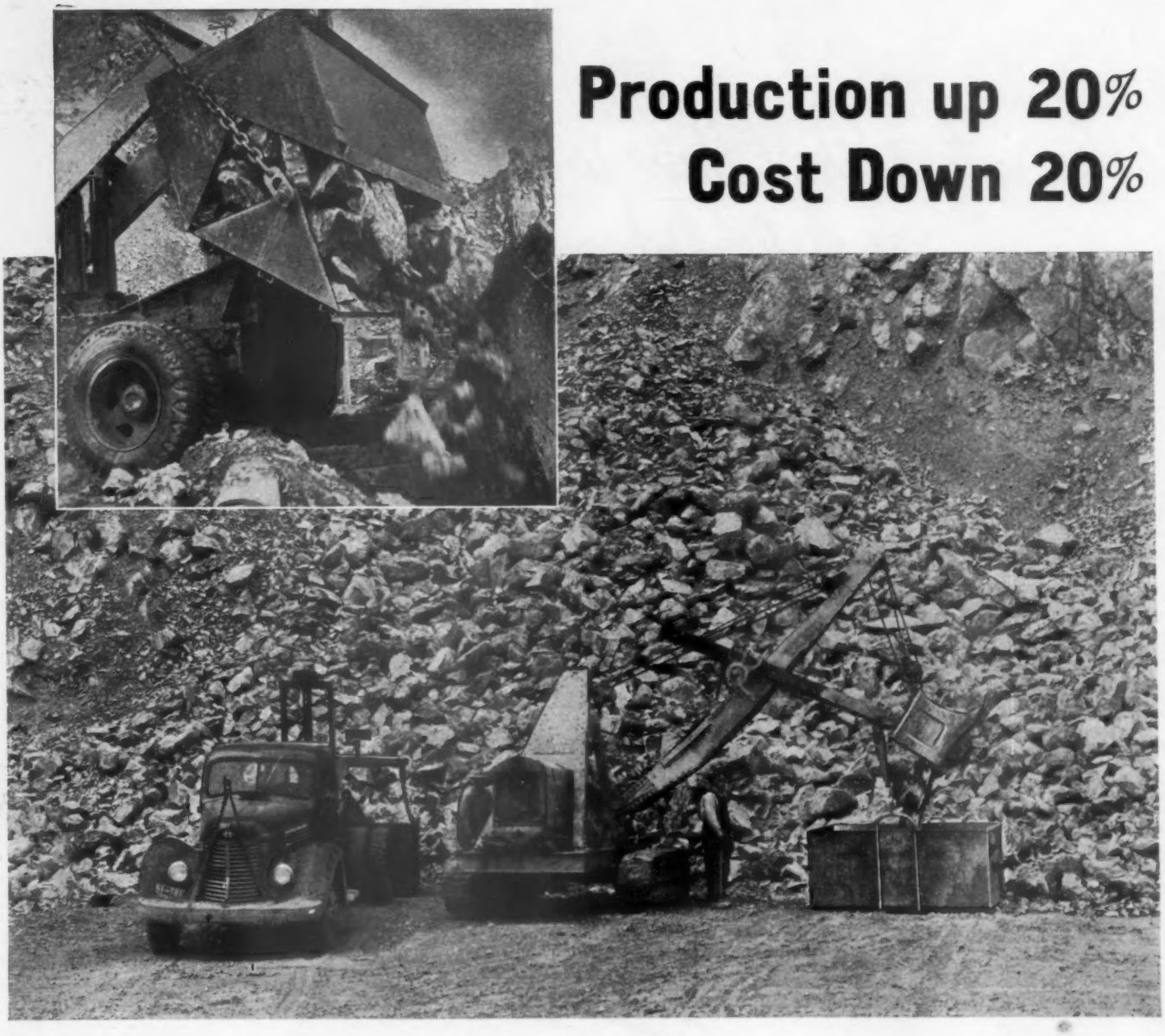
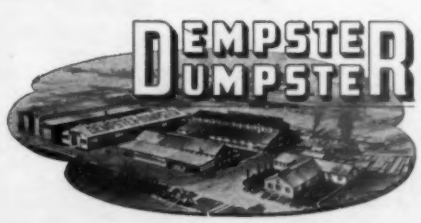


★ Here is a typical example of what fakes place when a quarry changes over to the Dempster-Dumpster system of hauling material.

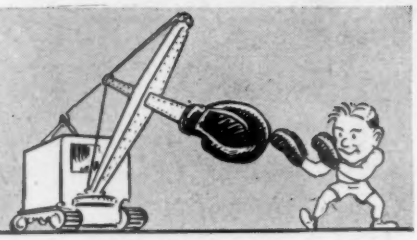
In the operation illustrated above—a large western limestone quarry—the method of hauling was changed from track and cars to a Dempster-Dumpster Unit and a number of detachable bodies. Although bodies are loaded by mechanical shovel, production has been increased 20% and costs of production reduced 20%. Where hand loading is the method used in loading the detachable bodies, production and savings are usually greater.

No amount of words can explain how simply and easily the Dempster-Dumpster can make such savings possible. But to see it in operation is all that is necessary to convince you that once put in operation, increased production and great reduction in cost are sure.

When one Dempster-Dumpster and a number of bodies can do the work of 3 to 5 conventional trucks, big savings in gas, tires, trucks and manpower are sure. Write for complete information. Dempster Brothers, Inc., 15 Springdale, Knoxville, Tenn., U.S.A.



Operators Don't Have to Fight a Buckeye!



Send for a copy of "The Age of the Clippers." Learn about the man-saving features of Buckeye Clippers and their 24 points of superior design and construction for your post war operations.

Operators don't have to wear themselves out fighting your shovel if it's a Buckeye Clipper — because Buckeyes have "Mevac" Metered Vacuum Control.

Note the streamlined instrument panel and simplified "Mevac" operating levers in the cab of the Buckeye Clipper. "Mevac" Metered Vacuum Control (similar to that used for years on big highway trucks) makes shovel operation faster and easier. The operator moves the handles—the vacuum does the work. The result is a bigger day's work with less operator fatigue.

Buckeye Clippers are made in 1/2 and 3/4 yard capacities and can quickly be converted to trench hoe, crane or dragline. Features include automatic swing brake; patented non-clogging, self-cleaning crawlers; automotive type power transmission and other design features that make for faster, easier operation, longer life and minimum maintenance.

Quickly convertible from shovel to trench hoe or dragline.

Built by Buckeye

Buckeye Traction Ditcher Co., Findlay, Ohio

Convertible Shovels

Trenchers

Tractor Equipment

Road Wideners

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May, 1945

The CONCRETE MANUFACTURER

A Special Section of...

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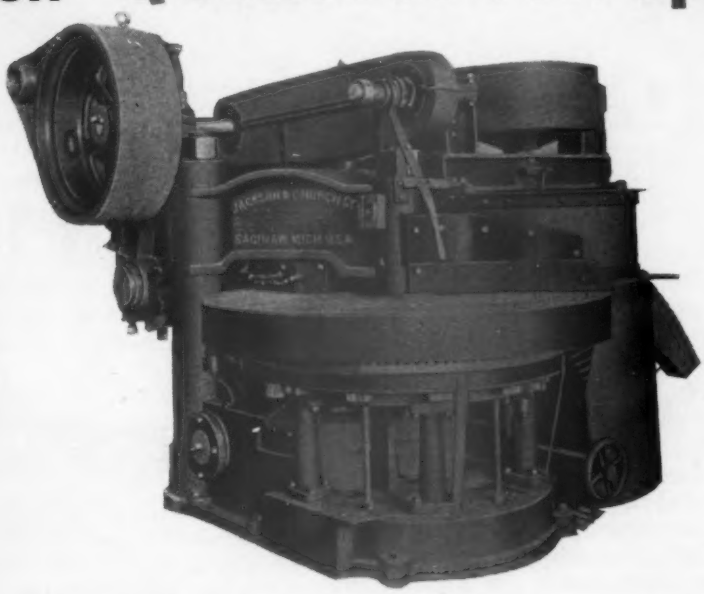

J&C CONCRETE BRICK MACHINE

KEEP UP with increasing demands for concrete bricks and keep down your manufacturing costs by installing this J&C *high-speed* unit.

Making 28,000 perfectly shaped bricks in one 8-hour shift is *plenty* fast. NO PALLETS REQUIRED, eliminating time wasted in handling and storing. Flat deck platform for minimum first cost.

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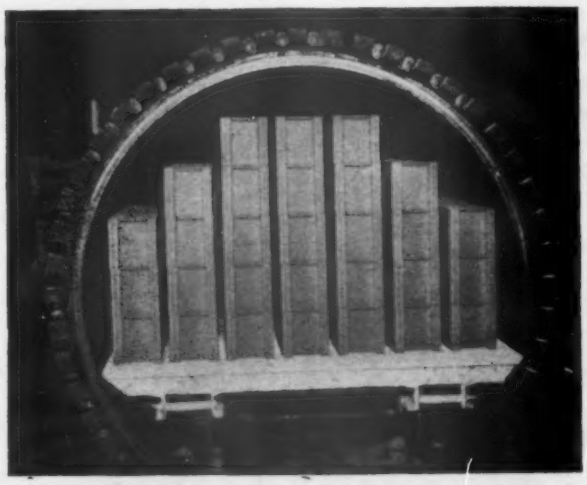

J&C HIGH PRESSURE STEAM KILN

KEEP DOWN time and material losses by curing your bricks in a J&C High Pressure Steam Kiln.

Fully-aged, shrinkproof products delivered in 24 hours from molding machine to construction job.

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The CONCRETE MANUFACTURER

MAY, 1945

A SPECIAL SECTION OF PIT AND QUARRY DEVOTED TO PRODUCTION OF CONCRETE PRODUCTS AND READY - MIXED CONCRETE

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A.S.T.M. Changes Its Specifications for Hollow Units

The Portland Cement Association called attention in a recent release to A.S.T.M. specifications for concrete masonry units, published in the association's 13-page bulletin. An important change in specifications for hollow load-bearing masonry units (C90-44) was given special mention, as follows:

"Where concrete masonry units are used in exterior walls below grade, and for unprotected exterior walls above grade, the minimum compressive strength requirement is 1,000 p.s.i.; these units are designed as Grade A. Where concrete masonry units are used above grade and protected from the weather with two coats Portland-cement paint or other satisfactory waterproofing, the minimum compressive strength requirement is 700 p.s.i.; these units are designated as Grade B."

There is no change in that portion of the specifications where concrete masonry units have face shells less than 1¼ in. and over ¾ in. thick.

While the moisture limitation remains the same as in the previous specification Table 1 physical requirements, there is reason to believe that this 40 per cent. maximum moisture content requirement will be more rigidly enforced in the future.

The association recommended that those in the construction field use the new A.S.T.M. specifications, C90-44, instead of C90-39.

Soldier-Operator Writes of Remodeling at Plant

Pfc. Joseph P. Belick, who formerly operated block plants at Northampton and Coplay, Pennsylvania, and stone quarries at Northampton and Little Gap, Pennsylvania, now is stationed at a B-29 base in India where he is still an interested reader of PIT AND QUARRY. Mr. Belick writes that he has arranged for extensive remodeling at his Northampton plant, where a No. 7 Joltcrete block machine and bucket elevator are being installed. This plant, operated by Mr. Belick from April, 1939, to March, 1943, had an annual capacity of 230,000 8-inch units. With the aid of modernized equipment, says Mr. Belick, the annual output will be tripled. He adds that after the war he contemplates opening several branch plants.

New Office Location Announced by Loving

M. W. Loving, consulting engineer for the American Concrete Pipe Association moved his office from the Portland Cement Association building, 33 W. Grand Avenue, Chicago, to 228 North La Salle Street, Chicago, the association's new quarters, on April 1.

Hartford Concrete Loses E. J. Schantz

Edward J. Schantz, proprietor of the Hartford Concrete Products of Hartford City, Indiana, died April 1 in Indianapolis.

New Organization Formed by Lith-I-Bar

At a meeting of the Lith-I-Bar joist manufacturers held in Philadelphia on February 18, 1945, they decided to form an association and call themselves the Lith-I-Bar Associates. The purpose of this organization is to improve, develop and promote Lith-I-Bar concrete-joist construction for floors and roofs. It will prepare data sheets of interest to architects, engineers and themselves.

The present members of the Lith-I-Bar Associates are:

Arnold Stone Co., Greensboro, N. C.
Otto Buehner & Company, Salt Lake City 5, Utah.
Cambridge Cement Stone Co., Boston, Mass.
The Dextone Company, New Haven 3, Conn.
Economy Cast Stone Co., Richmond, Virginia.
The Formigli Corporation, Philadelphia, Penna.
Gravel Products Corporation, Buffalo, New York.
Lith-I-Bar Company of Calif., Los Angeles, Calif.

The headquarters and office of the Lith-I-Bar Associates are located in New Haven 3, Connecticut, P. O. Box 606, Herman Frauenfelder, sec.

Texas Manufacturer Specializes In 5-Inch-High Sand-and-Gravel Blocks

A general view of Chase Building Products plant at Dallas, Texas.

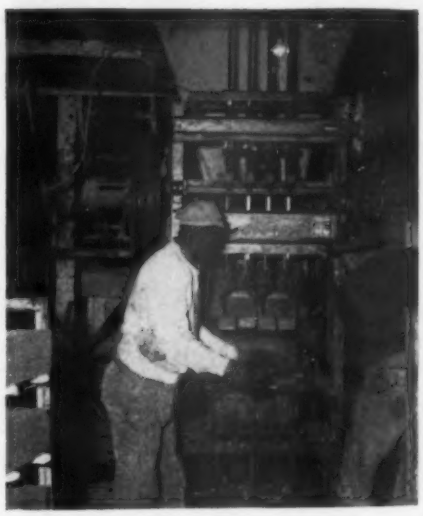
another ON THE SPOT report

THE Chase Building Products Company of Ft. Worth and Dallas, Texas, provides additional evidence of the extent to which concrete masonry units contributed to America's war effort in the critical three-year period following Pearl Harbor. Located in a section of the country in which, by virtue of ideal climate and terrain, it was inevitable that a vast number of industrial plants and training camps would be established, the Ft. Worth and Dallas plants of this company for the better part of three years poured their entire output into the construction of army camps, aircraft plants, hospitals, quartermaster depots and large-scale housing projects for war workers. The need for its products became so acute that for a period between January and April, 1943, the company made blocks in a 60- by 150-foot circus tent at Waco, Texas, in order to expedite the construction of a tank-destroyer center.

The company started its operations in Ft. Worth in 1927 as the Ft. Worth Concrete Tile Company, and from the very beginning development and marketing activities were concentrated on a 5- by 8- by 12-inch sand-and-gravel unit. The product was fittingly marketed under the trade name "Worthcrete Tile" and it gained a ready acceptance among builders in the Ft. Worth area. The spirited civic rivalry between Ft. Worth and the neighboring city of Dallas, 33 miles to the east, presented some thorny complications when the company began supplying the larger Dallas market. The mere fact that the blocks were produced in Ft. Worth might conceivably have been winked at in Dallas, but there was in addition that forthright trade-name "Worthcrete."

By WILLIAM M. AVERY

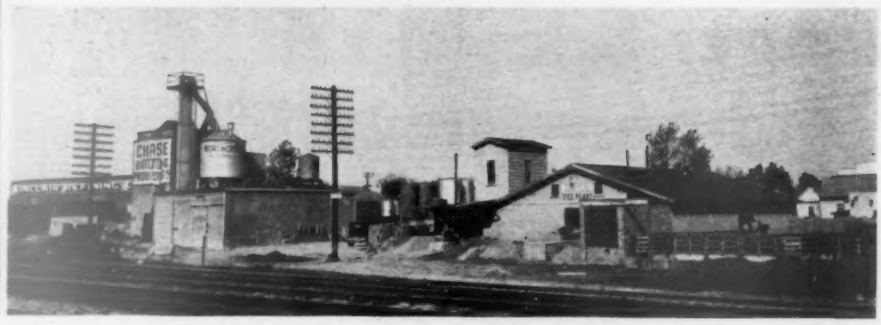
The dilemma was happily resolved in 1940 when the company built a separate block plant in Dallas and began producing masonry units identical with those manufactured at the Ft. Worth plant, but which are marketed under the more acceptable trade-name "Dalcrete." Now citizens of Dallas can build their homes with Dalcrete and have absolute assurance that they are getting a better product than could be secured in Ft. Worth, whose misguided citizens must be satisfied with "Worthcrete," and, of course, *vice versa*.



A stripper in operation at the Dallas plant, installed last year.

Two Anchor tampers are used at the Ft. Worth plant; one machine was specially designed for the 5-

Left: Office building at the Fort Worth plant. Right: Office at Dallas.



A general view of the Chase plant at Fort Worth, Texas.

by 8- by 12-inch units and the other was converted. A Stearns 12-cubic foot mixer and skip hoist supplies mix to one machine and a Besser mixer of the same capacity supplies the other machine by means of a flight conveyor. Fairbanks-Morse wheelbarrow scales are located at each mixer for weighing aggregates. The mix, consisting of high-early-

Skip hoist dumping to the block machine. At left, wheelbarrow scale for weighing aggregates. (Dallas plant.)

strength cement, pea gravel (minus 3/8-inch) and washed sand, makes a block which weighs about 18 pounds.

Both wood and steel racks are used, the former holding 69 units and the latter 80. The racks are moved both in the building and in the yard by means of Barrett-Cravens jack-lift trucks. After remaining under roof for a night, the blocks are removed to the storage yard where they are sprayed intermittently for 14 days before shipping. The only variation from this practice during the mild winter season is the addition of a small amount of calcium chloride to the mix.

The two tampers operated at the Ft. Worth plant make it possible to keep one machine exclusively on the production of full 5- by 8- by 12-inch units. The remaining machine is set up to produce fractional units.

The Ft. Worth establishment has a concrete-joist plant where 8-, 10- and 12-inch joists can be produced in lengths up to 24 feet. Both flanges of the I-shaped section are reinforced, and from 160 to 240 lineal feet per day can be turned out on the single vibrating table. The joists are manufactured only on specific orders and no stock is maintained. Other "specials" produced at Ft. Worth include a 2¼- by 8- by 12-inch brick-high unit and beam tiles, with troughs ranging from 4 inches to 12 inches, for pouring lintels, sills and tie beams on the job. The beam tiles are produced by hand-cutting the standard units while they are still green.

Production practices at the Dallas plant do not differ in any important respect from those followed at Ft. Worth. In May of last year a Stearns Model "A" Clipper was installed at Dallas to replace an Anchor tamper machine. An existing Stearns 12-cubic-foot mixer and a skip hoist were retained.

About 50 cubic yards of aggregate (pea gravel and washed sand) and a carload of cement can be stored in the plant building. The aggregates are weighed on a Fairbanks-Morse wheelbarrow scale and the mixing practice, yield and curing procedure are about the same as those in the Ft. Worth operations.

Workers in Fort Worth plant operating one of the two tamper block machines.

The Dallas and Fort Worth plants are now producing a light-weight unit (12½ pounds as compared to 18 pounds with sand and gravel) using Featherlite aggregate which is produced in Erath County, Texas, by the Erath Company. This unit is used as an acoustical block for

Lift truck removing a full rack from the block machine at Dallas plant.

theaters, churches, and other public buildings.

Both the Ft. Worth and the Dallas plants market a full line of building materials and specialities including clay, steel, glass and concrete products.

John S. Chase, past-president of the National Concrete Masonry Association, owns the Chase Building Products Company. J. W. White and James F. S. Campbell are the managers respectively of the Ft. Worth and Dallas plants.

Concrete Masonry Service Revealed by J. H. Besser

A new angle on a familiar subject was recently stressed by Jesse H. Besser, president of the Besser Manufacturing Company, Alpena, Michigan, in an address in New York City. Mr. Besser revealed that a newly-formed public information service on concrete masonry had as its most important function the relaying to women of appropriate facts on concrete building materials. He cited the force of women's opinions in the planning and building of post-war homes and declared that the war had brought a new appreciation of concrete masonry construction to many persons. Mr. Besser stated that experts had estimated a total of more than 4,000,000 homes would be built in the United States after the war.

New Massachusetts Plant is Both Photogenic and Highly Efficient

Container System Used for Handling Bulk Cement from Cars to Storage and to Batcher

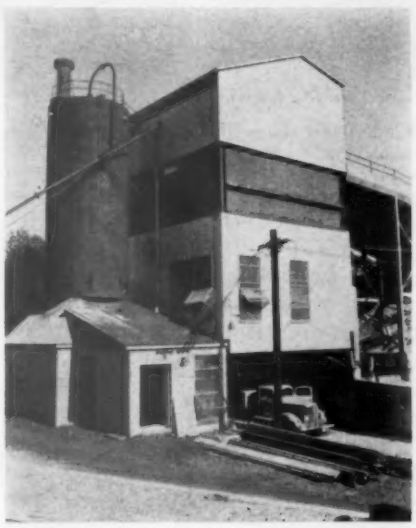
another ON THE SPOT report

By W. E. TRAUFFER

A FEW months ago when the writer had the privilege of visiting and inspecting the new ready-mixed concrete plant of the Valentine Concrete Company at Springfield, Massachusetts, he was agreeably surprised to find one of the best-designed plants he has seen. It looked like the kind of plant most operators hope to build some day and that is exactly what it proved to be. This is the ideal plant as visualized by Frank S. Valentine, treasurer of the company, from his 14 years of experience in the production of ready-mixed concrete.

Mr. Valentine, after having been in the lumber and builders' supply business since 1922, went into the production of concrete in 1930 with a small batching plant and 4 truck-mixers. This business grew until in 1942 a fleet of 10 truck-mixers was operated. In that year Mr. Valentime severed his connection with the lumber company and formed the present company with John B. Donovan as president and general manager and himself as treasurer. They at once began moving to the present property. Lack of space also made a move necessary and a garage for the trucks had been built there in 1941. The office and warehouse were next erected and the new concrete plant went in operation on September 1, 1944.

In designing the plant full advantage was taken of its location at the foot of a hill. The aggregates are brought in by trucks which back on a ramp direct from the street on the hill over the plant bins. The loaded mixer-trucks come onto this street on the level at the bottom of the hill. Another feature of this plant in the use of the l.c.l. container system not only in bringing bulk cement to the plant but also for transferring it from the auxiliary storage bin into the batcher feed bin. All buildings are of the most durable and fireproof construction. The bin structure and the ramp framework are structural steel but everything else, including the ramp floor, is made of concrete. The aggregate and cement storage systems have sufficient capacity to keep the plant operating at its capacity for a full day. There has been no great demand since the plant was built which would test its peak capacity but it is thought that 450 cubic yards can be produced in 8 hours without difficulty. When the demand is less than 150 cubic yards daily one man can operate the plant and unload the cement.

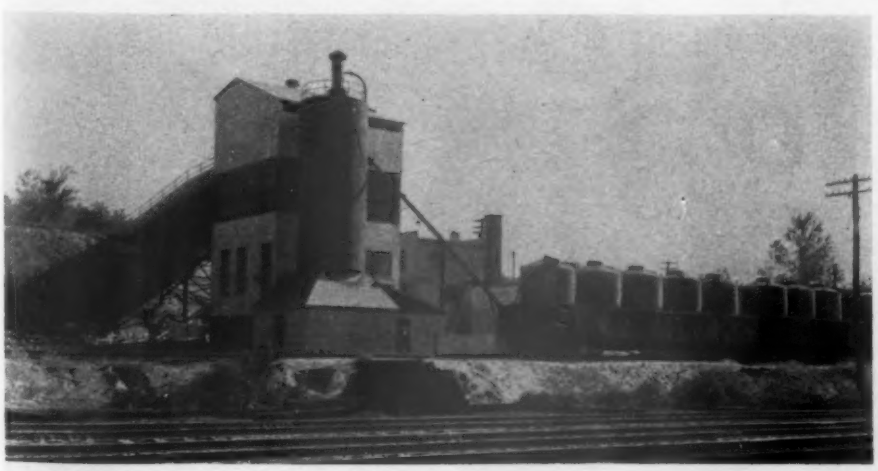


• View of the plant illustrating manner in which bulk cement is transferred from containers on cars to plant bins or auxiliary storage tanks.

• Left: Another view of plant with auxiliary cement tank at left. Above: John B. Donovan, president and general manager; and Frank S. Valentine, treasurer.

The sand and gravel used in this plant are brought 13 miles in trucks from the plant of the Western Massachusetts Sand & Gravel Company at Westfield, of which Mr. Valentine is vice-president. Crushed stone is trucked in from local quarries. The trucks back from the street on the 2-lane ramp which has a 16 per cent. slope and a span of 56 feet between the bins and the retaining wall on which its street end rests. The span is supported on three steel bents and has steel railings.

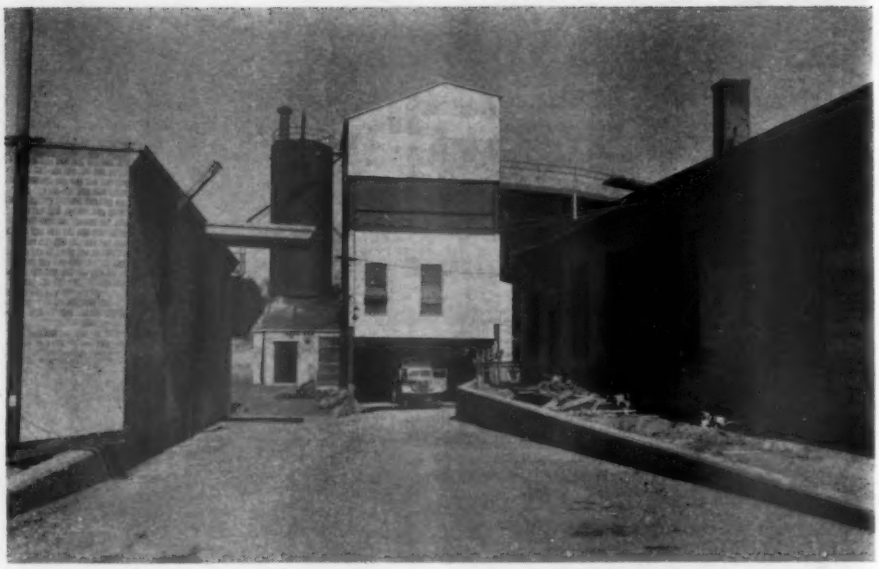
The 400-ton C. S. Johnson steel bin is square and has two rows of three aggregate compartments with a row of three cement compartments between them. One in each row of aggregate compartments is used for sand and in the other four are stored



pea, 1-, and 2-inch gravel, and trap rock or cinders. In each row the two compartments nearest the street are covered with I-beams spaced 4 inches apart which form the floor on which the trucks run and the grizzly through which they discharge. A buffer between the second and third bins stops the trucks when they discharge into the third compartment. The third compartment is open and the other two have 2-foot-square man openings in their grizzlies. In freezing weather bars are laid across these holes so that frozen lumps can be broken through them.

The l.c.l system of bulk cement handling used in this plant is quite commonly used in the East but many producers in other sections are not familiar with it. The 50- to 60-barrel Kennedy-Van Saun containers are owned by the New York Central Railway and are brought to the plant over the Boston & Albany Railway, a subsidiary. Five containers are carried in each gondola car. At the plant one container at a time is hooked up to a 4-inch cement hose and a 1½-inch air hose. U. S. Rubber Company hose is used. Compressed air is used to pump the cement into either the three 250-barrel cement bin compartments or a 750-barrel auxiliary storage tank. Under the auxiliary tank an l.c.l. container or bottle is mounted on concrete foundations and this transfers cement from it to the bin compartments as needed. This tank is equipped with an upper-level Bindicator and it and both the bins are ventilated.

The air for cement handling is supplied by a 388-c.f.m. Worthington 6-cylinder, air-cooled compressor driven by a 75-horsepower motor. A 3-foot diameter by 8-foot air receiver tank is used to insure a steady air supply and to remove condensed moisture.



• This view shows the paved driveway between the truck garage at right and the warehouse at left which has its floor level at a height which facilitates handling of special sacked cement to truck mixers.

The cement is discharged through rotary valves and the aggregates through arc gates, all lever operated, into the Johnson 4-cubic yard weighing batcher which has a center cement compartment, A 6-beam scale is used for aggregates and a 2-beam scale with an "over-and-under" dial for cement. The batched materials are discharged into truck-mixers through a lever-operated gate.

Mixing water is obtained from the city mains at 90-pound pressure and is measured in an automatic calibrated tank.

The plant layout is such that the truck-mixers come into the yard at street level on concrete pavement, pass between the garage and warehouse and circle around the plant, coming under it from the rear. The loaded trucks come out from under the plant on the same 2-lane drive past the warehouse. According to Mr. Donovan, this loop system is a great time saver. If special cements are desired these can be dumped from sacks from the elevated floor of the warehouse into the mixers.

The truck-mixer fleet now consists of nine 4-cubic yard machines, seven Rex and two Ransome. These are mounted on Autocar and White chassis. Deliveries are made regularly for distances up to 15 miles from the plant.

Provisions have been made for operation in freezing weather. Steam pipes have been installed in the aggregate bins and there is a hot water tank on the batching floor. The steam is provided at 15 pounds pressure by a 45-horsepower Fitzgibbons boiler with an oil burner. There is another small boiler for heating the garage and this is connected to the plant heating lines so that it can supplement the main boiler if and when necessary.

Most of the concrete produced for general demand is designed according to the specifications in the *Concrete Manual* of the Bureau of

• The 4-cubic-yard weighing batcher with its 6-beam scale for aggregates and 2-beam scale and "over-and-under" dial for cement.

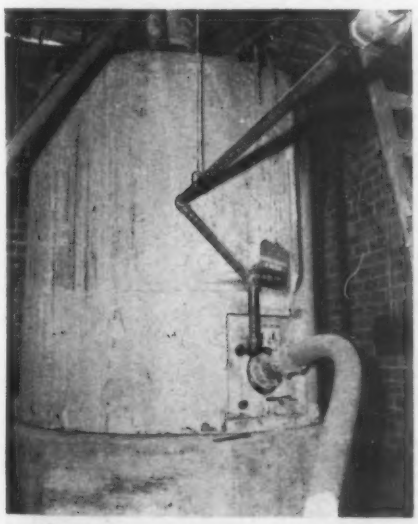
• The concrete ramp from which trucks discharge aggregates direct into plant bins. Concrete retaining wall is visible at left.

Reclamation, U. S. Department of the Interior. In these designs allowance must be made for the unusually high specific gravity of the sand used. On special jobs where an engineering or testing laboratory is specified the mixes are designed by Miles N. Clair of the Thompson & Lichtner Company, Boston, which also makes all tests.

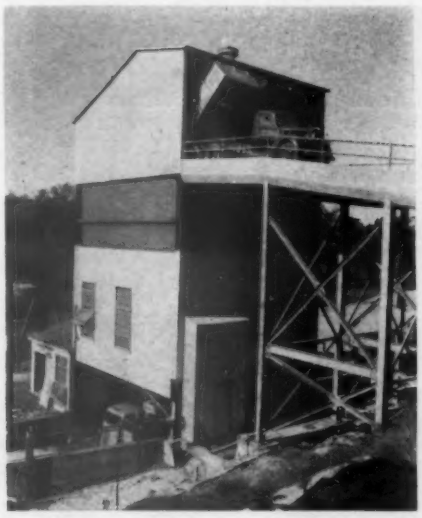
No admixtures of any kind are used in the concrete but air-entraining cement has been used successfully for over two years for concrete exposed to freezing and thawing, or where water seepage or exposure is a factor, as in canal walls, pavements, power-house foundations, spillways, etc. For ordinary demands standard Portland cements are used.

• One of the nine 4-cubic yard truck mixers in position for loading under the plant.

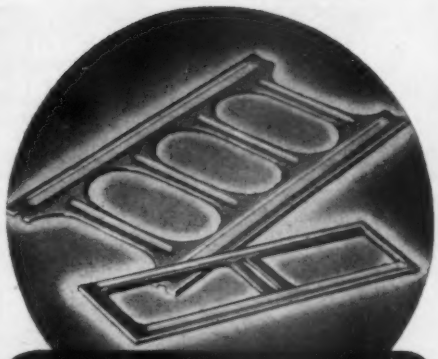
Before the new plant was built the company produced considerable concrete for war-plant construction from temporary batching plants at other locations. In 1941 such a plant was installed at Windsor Locks to produce the concrete for Bradley Field. Early in 1944 this plant was moved to Northampton where the Leeds army hospital is being built. This is an Erie sectional portable plant and may be kept at Northampton for permanent commercial operation. In 1938 a small permanent batching plant was set up at the Westfield gravel pit to serve the local trade.



• The l.c.l. container under the auxiliary cement storage bin which transfers cement from it to plant bins.



• Another view of the plant showing truck on ramp discharging aggregates into bins.



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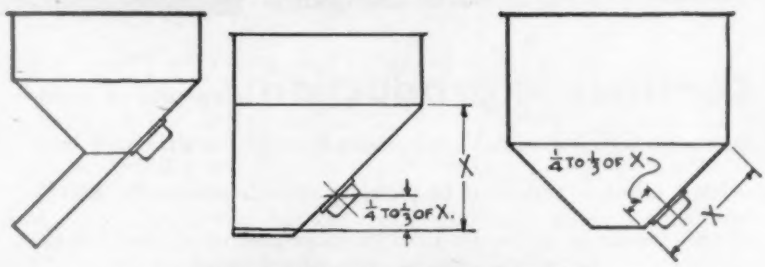

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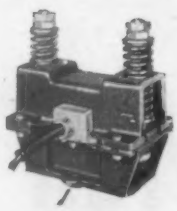

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Write us about your problem—giving dimensions, thickness of hopper walls, material handled, etc.

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+ Packing + HANDLING + Storage + HANDLING

HANDLING — the Common Denominator of PRODUCTION

LET MEN DIRECT POWER—NOT GENERATE IT!

Continuous production depends, in great measure, upon a smooth, constant flow of materials. When skilled labor is required to move materials manually, much of the efficiency of modern production machinery is wasted. An uncontrolled flow of material can slow down production, too little material can stop it.

A modern, mechanized handling system is necessary to maintain production schedules. Towmotor, the *one-man-gang*, will provide an accurately controlled supply of material, in the right quantities, at the right time and place. The Towmotor DATA FILE tells the complete story—write today.

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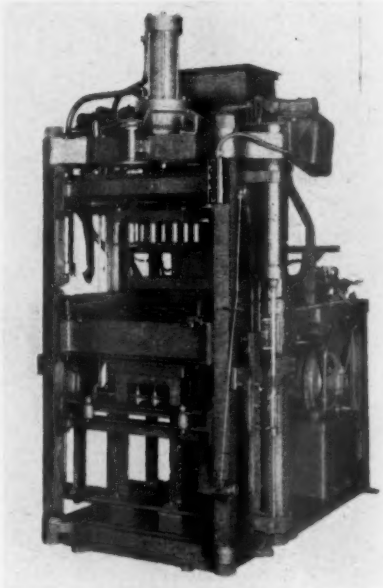
● Hydraulic Block Machine

An automatic hydraulic Vibra-Press manufactured by the Kent Machine Company, Cuyahoga Falls, Ohio, turns out various types of building units two and four at a time in a 9-second cycle. Since the vibration is within the mold box, where it is insulated from the rest



Hydraulic block machine

of the machine, there is a minimum of fatigue and breakage of vital parts. Vibration, pressing and full floating of mold box and cores are the features utilized to secure constant density and size.

● Overhead Driver's Guard

In an effort to provide maximum protection for its lift truck operators, Towmotor Corporation, Cleveland, Ohio, has developed overhead guards to fit all Towmotor models. Constructed of rug-

Truck with steel tube guard.

ged steel tubing and easily installed, the guards come in two standard sizes.

When installed, the guards extend in front of, over, and behind the operator. Transverse lengths of 1½-inch steel tubing in front and above are notched and arc-welded to side-members of the frame. Back sections of the side frame members are made of 1½-inch standard black steel tubing, while the front sections, which telescope over the back sections, are 2 inches in diameter.

Trade Notes

Stearns Manufacturing Company, Adrian, Michigan, recently published a bulletin stressing the firm's "four duties"—an all-out effort to help win the war, maintenance service, furnishing production equipment and meeting post-war needs.

The Stearns Manufacturing Company, Adrian, Michigan, is sending a 160-page book, Practical Blueprint Reading, as a gift to all concrete masonry manufacturers. The company manufactures Stearns Joltcretes and Clipper Strippers, in addition to mixers, skip loaders and other concrete masonry equipment.

Trade Literature

WAYLITE AGGREGATE. 8 pages. The Waylite Company, 105 West Madison Street, Chicago 2, Illinois.

A.S.T.M. 1944 Standard

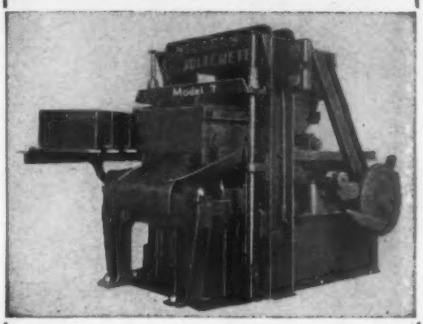
American Society for Testing Materials advises that revised standard for Hollow Load-Bearing Concrete Masonry Units has been approved as standard. The new standard will be published in the 1944 Book of A. S. T. M. Standards, Part II, under designation C90-44.

Proportioning Methods

The second issue of *Stone Briefs*, a National Crushed Stone Association publication, describes a method for proportioning concrete for pavements to have either the required cement factor or the required flexural strength. It also explains how to account for the included air when air-entraining cement is used.

The Stearns Mfg. Company, Adrian, Michigan, was recently awarded a third star for their Army-Navy "E" flag.

The Vibration Machine Supreme



Vibration under pressure — 7,200 blows per minute—and ruggedly built to give long life, the Joltcrete machine is the choice of the wise concrete-products operator. Produces clean-cut, high strength units in any size, and gets the most out of a bag of cement. Built in three sizes with capacities of 7 to 9 standard units per minute.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers and Joltcrete, Stearns mixers and Cast Iron and Press Steel pallets, Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal, Universal, Stearns, Blystone mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
G. M. Friel, Manager — Columbus, Ohio

***Just feed it*... the APPLEY**
"LITTLE GIANT"
Concrete Block Machine

Vibrating Action
Rugged Construction
Versatile Production

Price $995.00
F.O.B. Factory

and reap top-notch quality and profits

NO MORE SLOW AND FAULTY HAND TAMPING . . . *now* the small block operator can meet competition successfully with the APPLEY Little Giant. This is a low-priced, vibrating machine that moulds perfectly cut blocks of maximum strength and density.

The Little Giant is simply designed and durably built for continuous, economical production at speeds up to 120 8" x 8" x 16" blocks per hour. Interchangeable cores and partition plates for supplying all standard sizes. Write for Bulletin.

J. W. APPLEY & SON, INC., 831 Ninth St., No. St. Petersburg 4, Fla.

The "Quinn Standard"
FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 30 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

Quinn Heavy Duty Pipe Forms

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for any diameter pipe from 12 to 84 inches—tongue and groove or bell-end pipe at lowest cost.

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America's Finest Molds and Lowering Device

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Do You Remember — That Agile Central Mixing Plant?

UTAH
INDIANA
TEXAS
ARKANSAS
The Mystery of the
REAPPEARING
CENTRAL MIXING PLANT
Engineered
BUTLER
Design
Be on the lookout for a Butler central mixing plant; height about 75 feet; wearing a coat of gray paint; last reported in the State of Washington; has also been seen in Texas, Utah, and Indiana. Has a long record of production—nearly 600,000 cubic yards of concrete poured, and more to come. 150 yards per hour for days on end.
Though it sounds something like a mystery novel, there is really nothing mysterious about the remarkable performance of this plant—it is a Butler Engineered Design. Butler engineers have been designing plants for more than twenty years, plants whose efficiency, dependability, and versatility are built in. No wonder, then, that they are as good on their tenth job as on their first.
If you have a concrete job, large or small, be sure to call upon the Butler engineer. His suggestions are available to you regarding central mixing plants, ready mixed concrete plants, bulk cement plants, batch bins, and crushing plants. The first step toward the most successful job is Butler Engineered Design.
BUTLER
BIN COMPANY
WAUKESHA, WISCONSIN
Engineered
BUTLER
Design

Presto! IT'S REAPPEARED AGAIN!

During 1944 a Butler advertisement appeared which said, "Be on the lookout for a Butler central mixing plant; height about 75 feet; wearing a coat of gray paint; last reported in the State of Washington; has also been seen in Texas, Utah and Indiana. Has a long record of production — nearly 600,000 cubic yards of concrete poured and more to come. 150 yards per hour for days on end."

That Butler central mixing plant with an itch for sight-seeing has now appeared in Arkansas. The prophecy of "more to come" was no exaggeration for the total production of that rugged Arkansas Traveler is today well over a million yards — and — we repeat — "more to come".

A million yards! That's equivalent to a concrete highway 8 inches thick, 20 feet wide and 384 miles long!

Whether it's central mixing plants, ready mixed concrete plants, bulk cement plants or batch bins Butler Engineered Design generally means *service* far beyond reasonable expectations.

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Model "R" Sewer-Pipe Machine

Range of Sizes—4" to 18"

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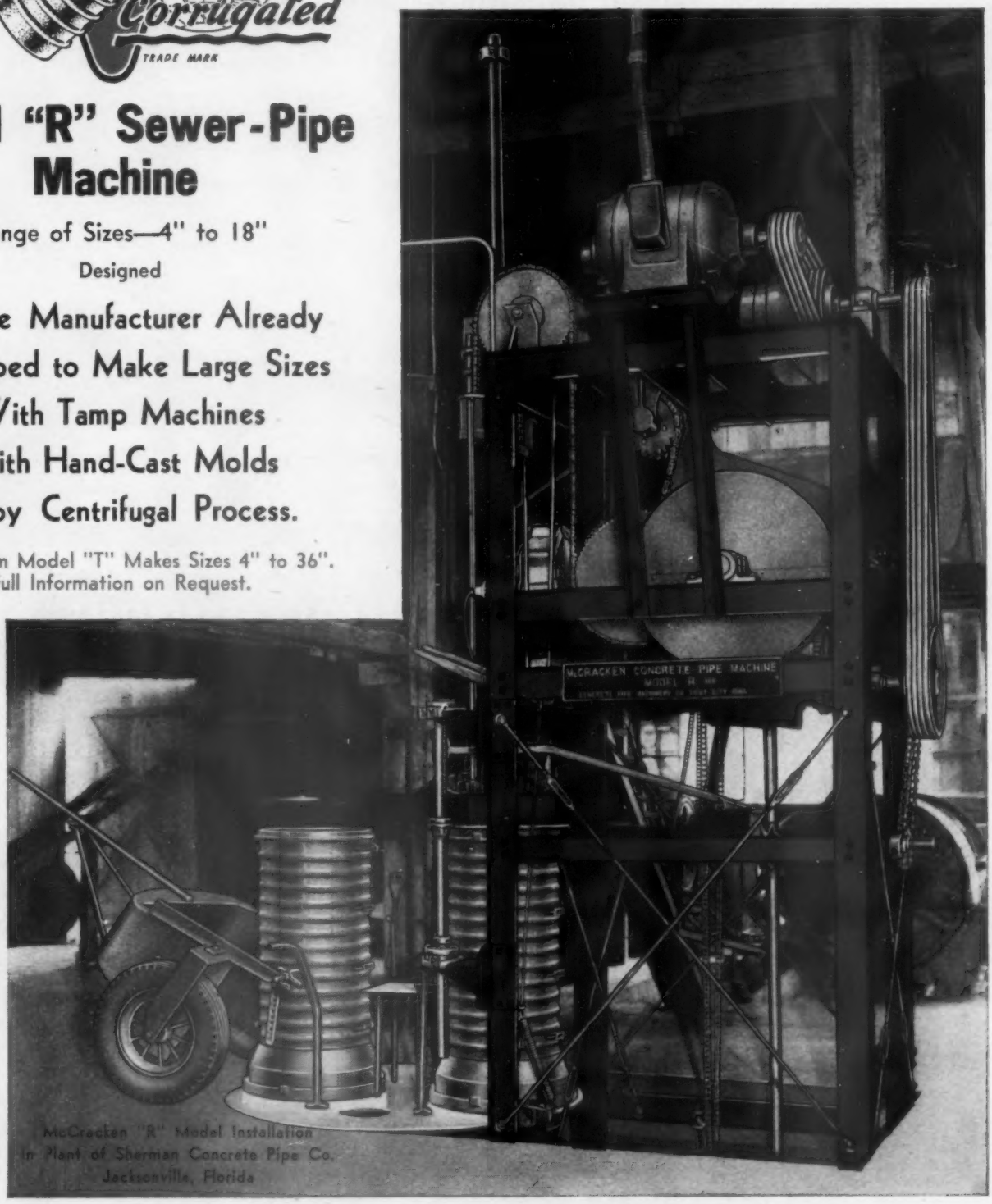
For the Manufacturer Already Equipped to Make Large Sizes With Tamp Machines With Hand-Cast Molds or by Centrifugal Process.

McCracken Model "T" Makes Sizes 4" to 36".
Full Information on Request.



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Only the Packer-Head Process Makes 4" to 18" Pay Real Profits, Because:

1. It makes two pipe per minute.
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8. Extra Products and New Markets:
   - A—Drain Tile.
   - B—Underground Conduit for Electric Wires.
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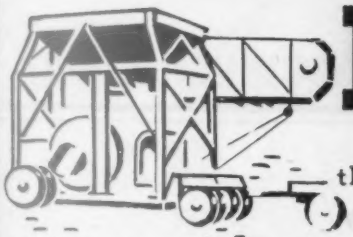
The CONCRETE MANUFACTURER



LOOK AHEAD with Erie Steel to the post war demand for specification concrete delivered to the job at rock bottom cost ★ We introduced the Strayer *Portable* Concrete Plant a few years before the war and with the release of materials will be ready with the smoothest operating unit that will provide a fast loading, storage, batching, weighing and mixing concrete unit that will give you up to 40 yards per hour of highest grade concrete at the job ★ General and Road contractors will find it the answer to highway culverts retaining walls, small bridges, buildings, housing and many other concrete uses ★ Plan ahead . . . get the facts on the performance of the Strayer Portable Concrete Plant ★

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What's this 1945 JAEGER got that no truck mixer ever had?

Built today in 2, 3, 4½ cu. yd. "Hi-Dump" models. These same improvements also available in "Low-Charge" types up to 5½ cu. yd.

1. **Faster Charging and Discharging to Speed Payload Trips:** Completely unimpeded 2-way flow of material thru enlarged drum opening and steep-angle hopper always sealed to drum, with "single turn" gate control that opens for the quickest discharge of any mixer on the market.

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3. **Positively Aligned Center Transmission and Drive:** 2-speed transmission and front drum support bearing are one unit with internal drum gear driven on center line, insuring positive and permanent gear alignment.

4. **Streamlined Over-All Housing:** More protection and "eye appeal" plus easier access to open type engine and one-minute-adjustable outside reversing clutch. (Truck engine drive if desired.)

5. Slump Meter, quick replaceable hopper seal ring (without removing hopper), improved drum roller assembly and many other features, added to the famous, exclusive Jaeger "Dual Mix" Action with Throw-Back Reversing Blades.

Ask your Jaeger distributor or write for Catalog TM-5 which gives complete details.

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PERFECT for the job that's wanted "yesterday"

All of us know the customer who's in such a hurry for a load of Ready-Mixed that "he wants it yesterday." If his job is in such a hurry, sell him an order of Ready-Mixed made with Medusa "Medco" High Early Strength Cement – which gives him a concrete that attains normal 5 to 7-day strength in 24 hours. Of course, it costs a little more, but your profits are higher. Write today for complete information on "Medco" Ready-Mixed.

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ONE MAN HANDLES 48 BLOCKS NO BREAKAGE

Handle your green concrete products the way that more than 800 other concrete products plants do, WITH BARRETT LIFT-TRUCKS EQUIPPED WITH A SUPER-SPRING FRAME AND RUBBER TIRES. Eliminate breakage — joggling out of shape and spoilage. Save time, money and labor by eliminating all unnecessary handling and breakage. Take your blocks direct from the machine to the curing room—with ease and dispatch. One man handles 48 blocks of the 8x8x16 size—or, 32 blocks of the 8x12x16 size.
Write for illustrated circular.

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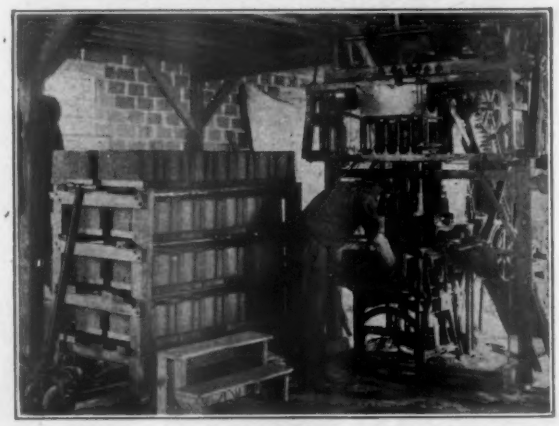

REFINEMENT in FEED GIVES ACCURATE MEASUREMENTS

of cement and aggregates by agitators in material hoppers plus thoroughness of mixing insure perfect concrete blocks.

KENT Continuous Mixer

KENT Two Hopper No. 2½ Mixer. Capacity, 8 cubic yards per hour.

Write for Bulletin

The KENT Mixer is an automatically operating precision machine that supplies a continuous stream of perfectly processed concrete. Just keep the hoppers full, and this unit will set a new production record and profit pace for your block machines. Requires no attention. Durably built for years of low cost service. Several sizes.

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Make 6" to 48" CONCRETE PIPE with ONE Machine

Produce Pipe Profitably

Universal's "All-Purpose" Machine produces Concrete Pipe in all sizes from 6" to 48"—and shows you a worth-while profit. With a tamping capacity of 680 strokes per minute, your product is more dense, durable, finished in appearance. We can also outfit you for making larger sizes, up to 135".

Write today for Catalog and Details.

UNIVERSAL Trade Mark

CONCRETE PIPE CO.
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Whether in Concrete or Cotton . . .

3¾ TONS is Lots of Load

But this sturdy HYSTER truck, with its powerful hydraulic hoist and rugged forks, will handle it. The 75 Fork Lift Truck handles loads up to 7500 pounds. It lifts, transports and unloads to truck, platform or ground; also stacks materials for storage—120 inches to underside of load.

Because ONE truck and ONE man does the entire job, savings are made in time, labor and costs. With traction-geared pnuematic tires, the 75 "navigates" with full loads on and off pavements. Trunnion steering simplifies operations in congested quarters. Write for catalog 694.

Pioneer manufacturers of mobile materials handling machines . . . fork lift trucks, crane trucks and straddle trucks. All gasoline powered; all pneumatic tire mounted.

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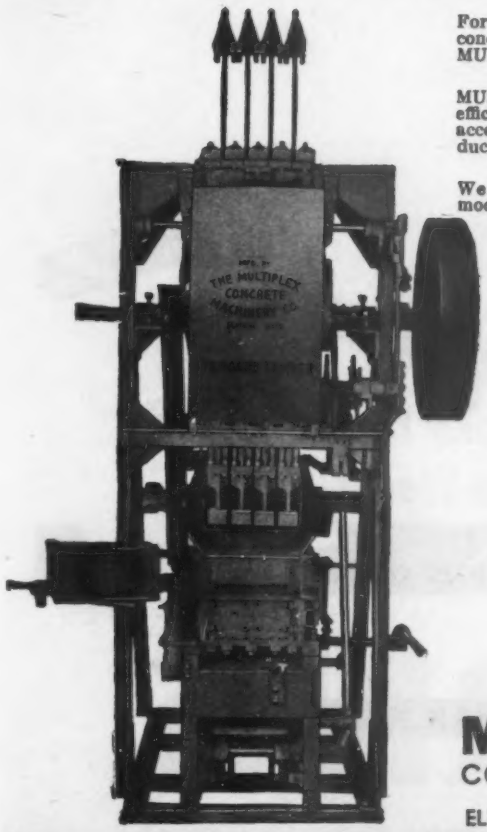
MULTIPLEX Machines For Postwar Profits



For a Quick "Take-Off" and sustained pace in concrete block output, reserve one of the MULTIPLEX *high-speed* machines.

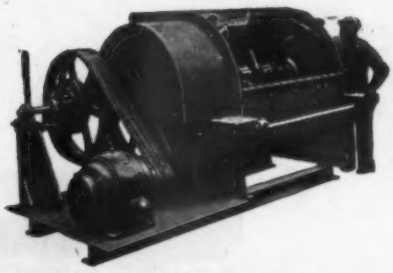
MULTIPLEX offers a wide variety of super-efficient mixing equipment, with all types of accessories necessary for economical mass production.

We can recommend MULTIPLEX units for modernizing *your* plant and enlarging its capacity.

Our universal type MULTIPLEX Standard Tamper for making plain and stripper, or face blocks, on one base. Easily convertible as business expands. Supplied with 4-bar or 8-bar tamper, either power or hand operated.

Write for Booklet describing the MULTIPLEX complete line of concrete mixing equipment, including Double and Single Hand Press Strippers, Power Press Strippers, and Super-Tampers.

The MULTIPLEX Flue Block Machine makes ventilated, solid or lightweight units, including all attachments for ventilator and stove pipe openings.

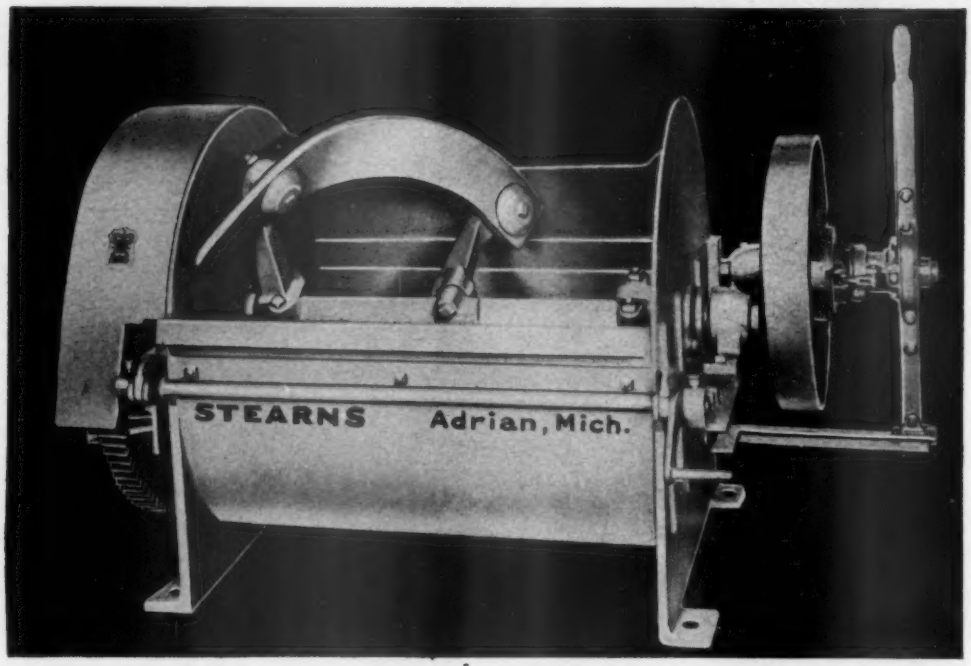


MULTIPLEX Multi-Mixer with reverse screw-type action insures fast and thorough mixing of every batch. Side, end or bottom discharge.

MULTIPLEX
CONCRETE MACHINERY CO.
Frank Muenzer, President
ELMORE • OHIO

The CONCRETE MANUFACTURER

. . . and now again!
Fourth "E" awarded
March 10, 1945



For better mixing at lower costs—

buy a STEARNS!

● **SIX GOOD REASONS** why hundreds of concrete products plants operate more Stearns Mixers than those of any other manufacture are indicated below. When you read them, remember that the plant performance of these machines speaks louder than the words of any advertisement.

6 REASONS FOR BUYING:

1—Lowest charging height.

2—Wear-resisting, removable, quickly shifted liner bars and "Sterloy" mixing blades cut maintenance costs.

3—Conveniently located door control and handy bag shelf save waste motion.

4—Discharge door opens easily, locks tight, won't leak.

5—Bearings: Self-aligning, anti-friction, dust-proof.

6—Drum of steel plate welded to heavy heads assures extra long life.

● **Stearns Mixers** do an outstanding job of fast, thorough mixing. They are supplied in capacities for every production need: 12, 18, 28, 42 and 50 cu. ft. with pulley, V-belt or Gear-head motor drive.

● **New Mixer Folder** illustrating and describing thees machines will be sent upon request.

Performance
Speaks Louder than Words
ASK ANY STEARNS OWNER

A FEW OF HUNDREDS

HUDSON SUPPLY & EQUIPMENT CO.
Washington, D.C.
Four Stearns Mixers

CHASE BUILDING PRODUCTS
Fort Worth, Texas
Two Stearns Mixers

BADGER CONCRETE COMPANY
Oshkosh, Wisconsin
One Stearns Mixer

STEARNS MANUFACTURING CO. - ADRIAN, MICH.

GENE OLSEN, PRESIDENT

Designers and manufacturers of vibration and tamp type block and brick machines . . . Mixers . . . Skip Loaders.
Licensed under the basic Gelbman Vibration Patents.

Getting results...in a BIG way!...

In 1939, when Hitler struck at Poland, trucks took only a few hundred thousand tons of ore from America's iron mines. *In 1944, trucks hauled out* OVER 50 MILLION TONS!

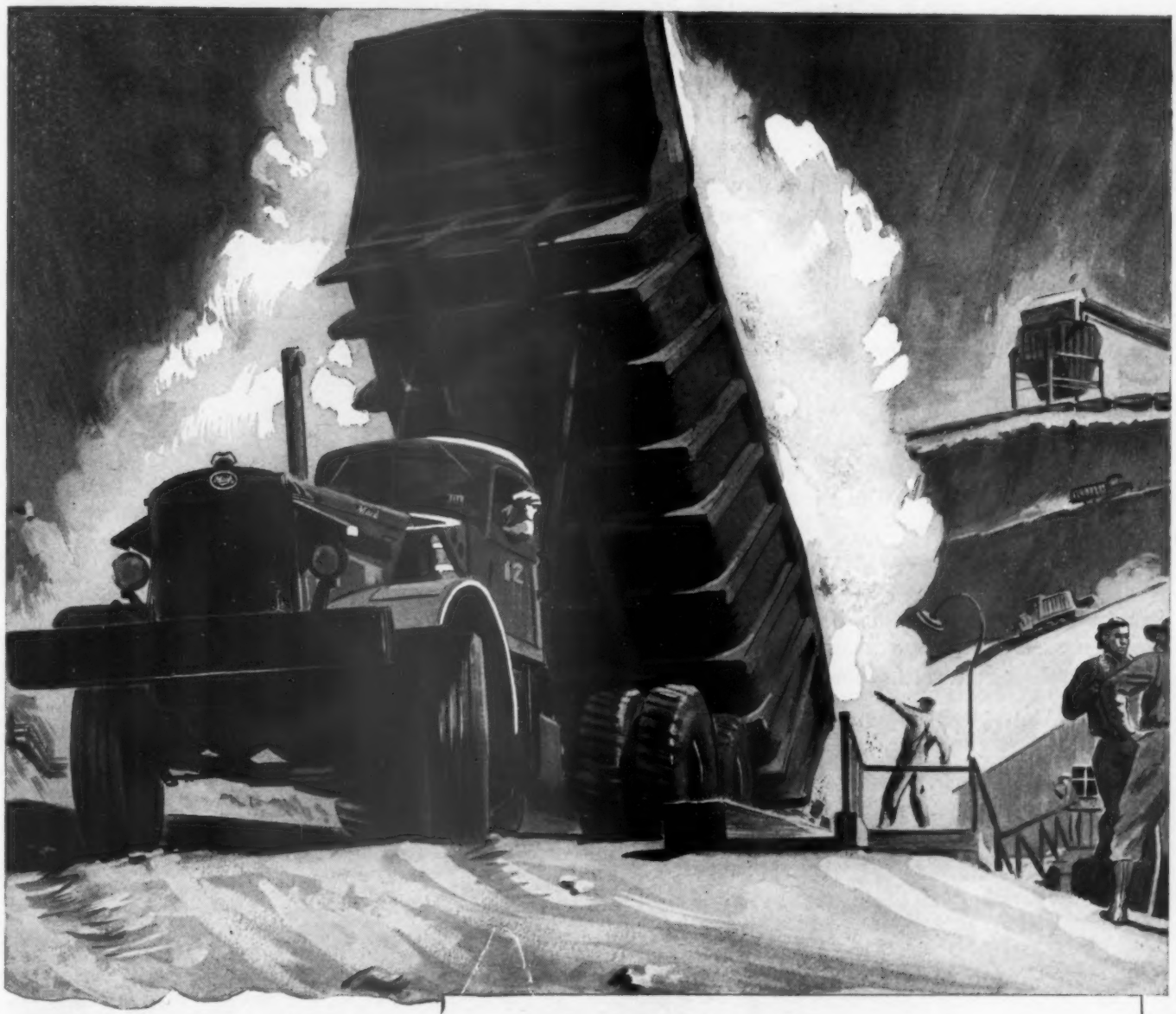
This ore plus scrap metal makes over 35 million tons of steel . . . more than all the steel in all passenger cars now on the road. It is steel enough for almost a million medium tanks . . . or over 110 million 50-cal. machine guns . . . or 15 million big 16-inch Navy shells . . . or more than 800 mighty battleships.

Huge 6-wheel, 30-ton capacity Macks like the one shown below, as sketched by Peter Helck, are doing a lion's share of this big ore-hauling job.

The biggest trucks in standard production today . . . these Macks have *lowered* open pit mining costs, while time and again setting new production records on the job.

Their work is typical of the many, many ways in which Macks, both big and small, are serving the people of America . . . and helping their owners cut costs.

Their stamina is a good example of why Macks for 44 years have been America's No. 1 line of trucks for tough hauling jobs.



★ BUY THAT EXTRA WAR BOND TODAY ★

Mack Trucks, Inc., Empire State Building, New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J., New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts.

Mack
TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

Performance Counts!

More Aglime for More Food!

More food is needed, and there are fewer hands to produce it. Bigger crops from better soil is the answer, and aglime producers by the hundreds are responding with unprecedented tonnages of soil sweetener.

Typical of the many agricultural limestone plants equipped with Universal steel plate roller bearing pulverizers and other profit-proved Universal equipment are those pictured.

Representative of what Universal-equipped plants are doing for their owners and for the good of the country is the plant of A. R. Alvis, West Plains, Missouri, which is shown above averaging 250 tons of aglime per 8-hour day with fuel cost, including two quarry trucks and two 105′ air compressors for drills, approximating $18.08. Plant consists of apron feeder, 18″ x 24″ Universal Roller Bearing Primary Jaw Crusher set for 2″ opening, 4′ x 12′ 2-deck vibrating screen and hopper, Universal No. 3 Pulverizer and Rotovator and conveyors. This operator has contracts for 35,000 tons this season and is doing a considerable daily cash business besides.

When postwar road building and repairs "get the green light," it will only be necessary to change the screens and the manganese steel grates to produce 1″ to 1½″ material.

Trankle Bros., Waterloo, Illinois, Universal stationary aglime plant averages 90 to 100 tons daily.

Pine Hill Lime & Stone Co., Pine Hill, Ky., keeps production up with Universal hammer mill.

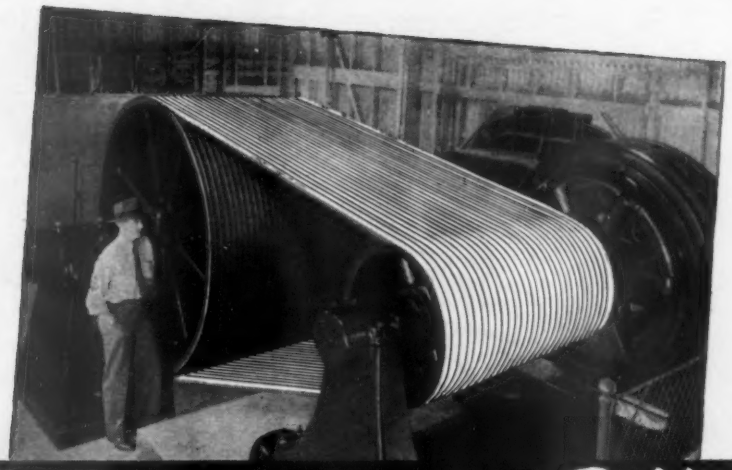
Universal engineers stand ready to help in converting your plant to aglime production and to assist in reconversion to road rock or aggregates after the war. Universal standard "packaged" units practically shipped from stock, keep the change-over and the operating costs low. Send for literature.

UNIVERSAL ENGINEERING CORP.
619 C Ave., W. Cedar Rapids, Iowa

ARMY E NAVY

UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS



Here is a noteworthy fact

GATES *Synthetic Rubber* V-Belts

—are *TODAY* delivering *BETTER SERVICE* than *Pre-War* Belts of *NATURAL RUBBER!*

—and here's the reason behind it

Every day, on battlefields all over the world, U. S. Army tanks, tractors and self-propelled big guns are giving Gates V-belts a severity of service that no belts built before the war could possibly stand. Gates developed these combat-unit V-belts through specialized research and is building them entirely of synthetic rubber!

The importance of this fact to industrial V-belt users is this—

● Every improvement developed by Gates for these Army V-belts has also been added, day by day, to the quality of the standard Gates Vulco Ropes which have been delivered to you.

In many other products, as you know, war-time improvements must be withheld from general use until after the war is won. Gates V-belts are a notable exception to this rule for the simple reason that Victory depends upon production and production depends upon V-belts to drive the producing machines. That is why Gates has been able to give you immediately in your standard Gates Vulco Ropes, every V-belt improvement which Gates specialized research has developed for used on the Army's motorized equipment.

It is because of these facts that the Standard Gates Vulco Ropes you are now getting are giving you better service than any V-belts that were ever built before the war.

THE GATES RUBBER COMPANY

Engineering Offices and Jobber Stocks in All Large Industrial Centers

THE MARK OF Gates SPECIALIZED RESEARCH

458

GATES VULCO ROPE DRIVES

CHICAGO 6, ILL. 549 West Washington. NEW YORK CITY 3, 215-219 Fourth Avenue ATLANTA 3, GA., 738 C. & S. National Bank Bldg.
LOS ANGELES 21, CAL., 2240 E. Washington Blvd. DENVER 17, COLO., 999 S. Broadway DETROIT 4, MICH., 8663 Grand River Ave.
PORTLAND 9, ORE., 333 N.W. 5th Ave. DALLAS 2, TEXAS, 1710 N. Market St. SAN FRANCISCO 3, CAL. 1090 Bryant St.

DRILL *in any position and at any angle*

Pneumatic tires now obtainable if specified by purchaser in his application for priority to Construction Machinery Branch of War Production Board.

with the

CLEVELAND DR30

★ By merely loosening two nuts, the Cleveland DR30 Wagon Drill can be swung forward or back and from side to side. Then set it as you wish—straight down, flat, breast high, higher than your head, within 4" of ground level, or even straight up. • Here are a few more important features of the DR30:

★ **Feed capacity over 8 feet, permitting 6-foot steel changes; handles depths to over 25 feet.**

★ **Recoil device holds machine to its work, increases drilling speed 10-25%.**

★ **Forward leg point holds the drill and steel in line on all kinds of holes.**

★ **Centralizer keeps steel from "walking" when starting hole, prevents breakage of bit points.**

★ **Twin jack-screw mechanism permits easy moving of U-bar, shortens set-up time.**

★ **Main wheels swivel 90° for line drilling, and 180° to obtain narrower tread.**

Write for Bulletin 132 that fully describes the most popular wagon drill ever built.

BRANCH OFFICES

Birmingham 1, Ala.
Butte, Mont.
Denver 2, Colo.
El Paso, Texas
Ironwood, Mich.
Lexington 19, Ky.
Los Angeles 11, Calif.
Newton Highlands 61, Mass.
New York 6, N. Y.
Philadelphia 30, Pa.
Salt Lake City 1, Utah
San Francisco 3, Calif.
St. Louis 3, Mo.
Wallace, Idaho
Washington 5, D. C.

CANADIAN DISTRIBUTORS

Purves E. Ritchie & Son, Ltd., 658 Hornby Street, Vancouver, B. C.

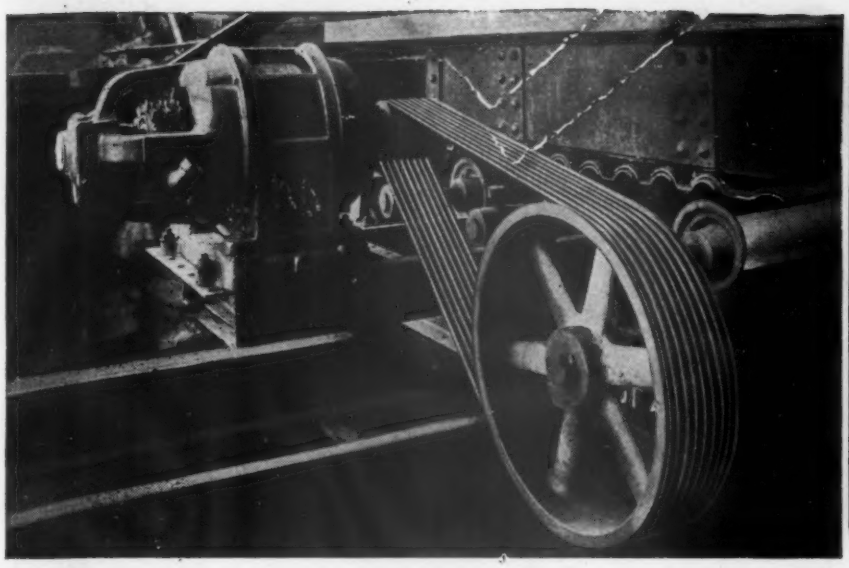
BUY U. S. WAR BONDS AND STAMPS

THE CLEVELAND ROCK DRILL COMPANY

Division of The Cleveland Pneumatic Tool Company

CABLE ADDRESS: "ROCKDRILL" • CLEVELAND 5, OHIO.

LEADERS IN DRILLING EQUIPMENT



GET THE *Time tested buy* IN V-BELT DRIVES

Wood's the LONG LIFE LINE

NEXT TIME BUY Wood's

Buy Wood's drives because, gauged both by built-in quality and reliable performance, they exemplify the outstanding buy in the V-Belt field.

Buy Wood's V-Belt drives because they are *designed* for efficient power transmission. They do the job of turning energy into work—bringing power from its origin to the driven machinery with minimum loss.

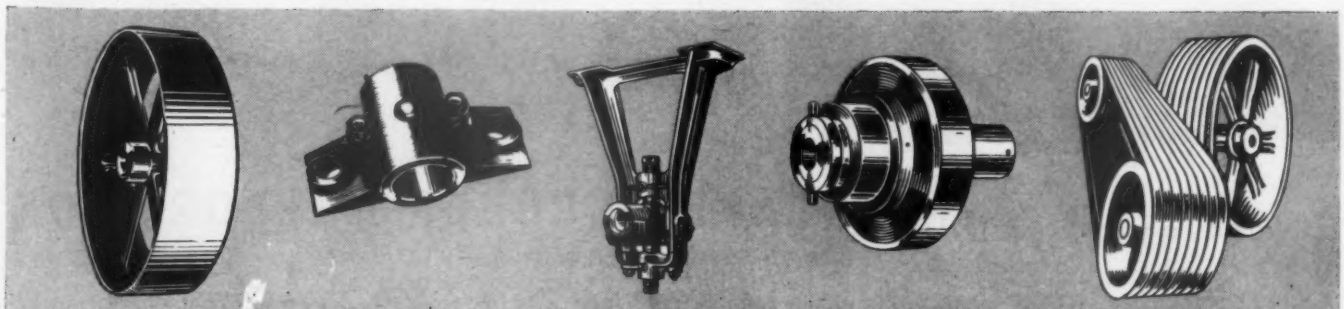
Wood's V-Belt drives render trouble free service . . . provide inherent day-in and day-out reliability at a low figure for maintenance.

Wood's products have stood the test of time. Since 1857 this complete line of transmission equipment—with an earned reputation for excellence—skillfully designed and efficiently manufactured, has been a dependable stand-by of industry.

Wood's V-Belt drives and other products of Wood's manufacture, will serve you faithfully in the post war era. Plan for post war now. Engineering consultation welcomed. Details furnished upon request—or see your conveniently located Wood's distributor.

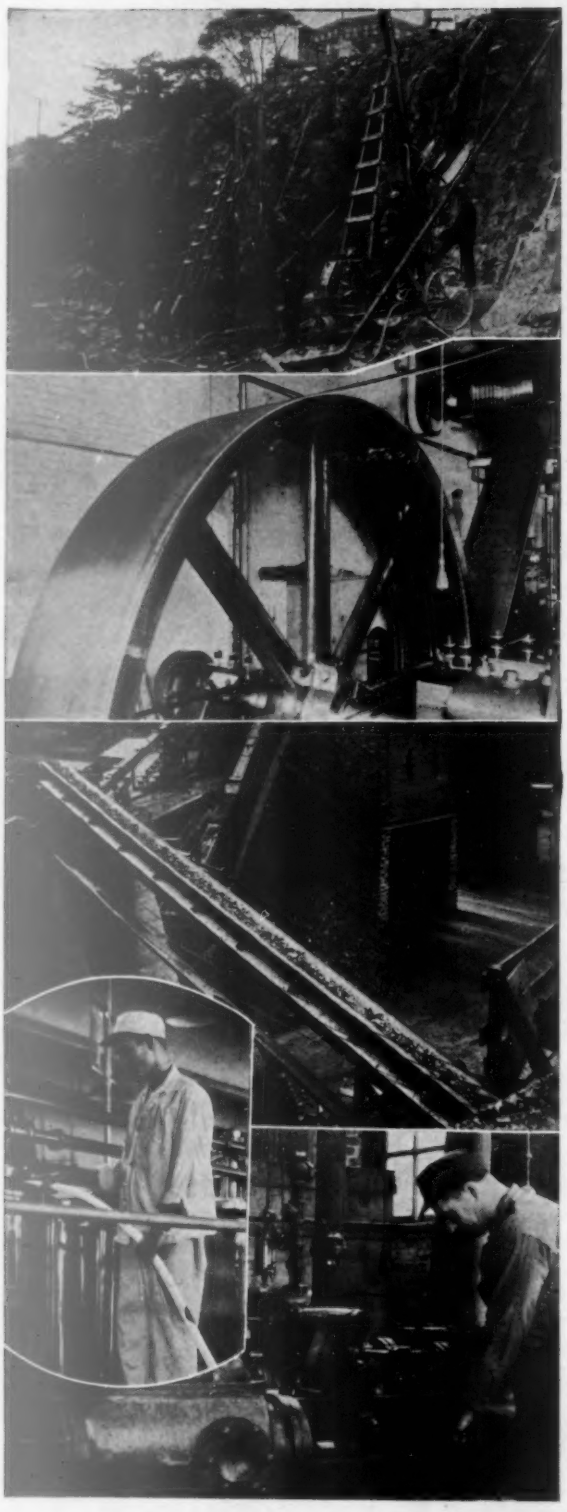
EVERYTHING IN TRANSMISSION

Bearings — Collars — Clutches — Couplings — Contactors — Hangers — Pillow Blocks — Pulleys — V-Belt Sheaves and Complete Drives



T. B. WOOD'S SONS COMPANY, CHAMBERSBURG, PENNA.

QUAKER



the well-known name in Rubber

Industrial Rubber Products are going to the many departments of the Government in large volume in the War effort. The brand name of Quaker will be found on many of these products of Belting, Hose and Packings.

Former Quaker employes, now Service men, writing from all parts of the world send us some very interesting letters telling where they see Quaker products in use, and how they are helping in the war effort. Much of Quaker's production is going to such destinations. There is not as much left for civilian users as we would like.

The day cannot come too soon for us so that Quaker can devote all our facilities to the turning out of products for civilian use.

This war has brought us face to face with shortages in many of our accustomed essential products in food, clothing and many of what we formerly considered necessities. Some day there will be enough Industrial Rubber Products to meet all demands.

It is good policy to keep on asking for Quaker —the name that stands for Quality Industrial Rubber Products.

"If there is a way to get it done —Quaker will do it"

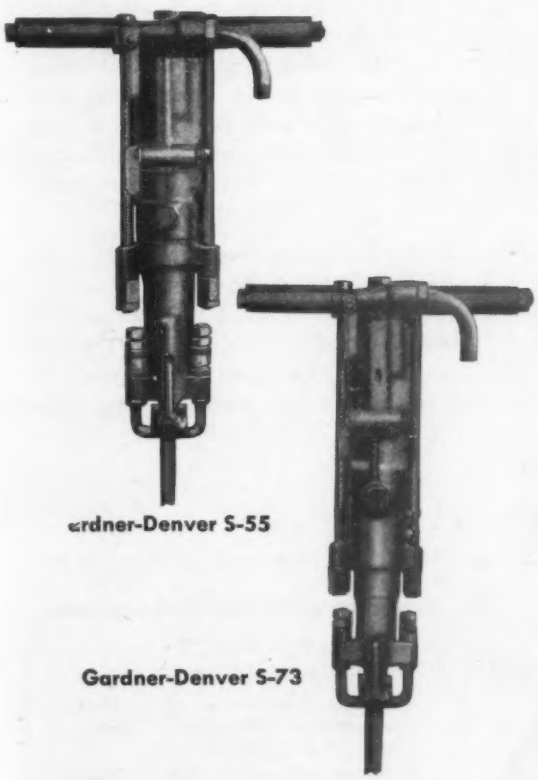
QUAKER RUBBER CORPORATION

PHILADELPHIA 24, PA. • NEW YORK 7 • CLEVELAND 15 • CHICAGO 16 • HOUSTON 1

Western Territory

QUAKER PACIFIC RUBBER COMPANY • SAN FRANCISCO 5 • LOS ANGELES 21

CLEAN



ardner-Denver S-55

Gardner-Denver S-73

HOLE CLEANING! That's the real test of a sinking drill.

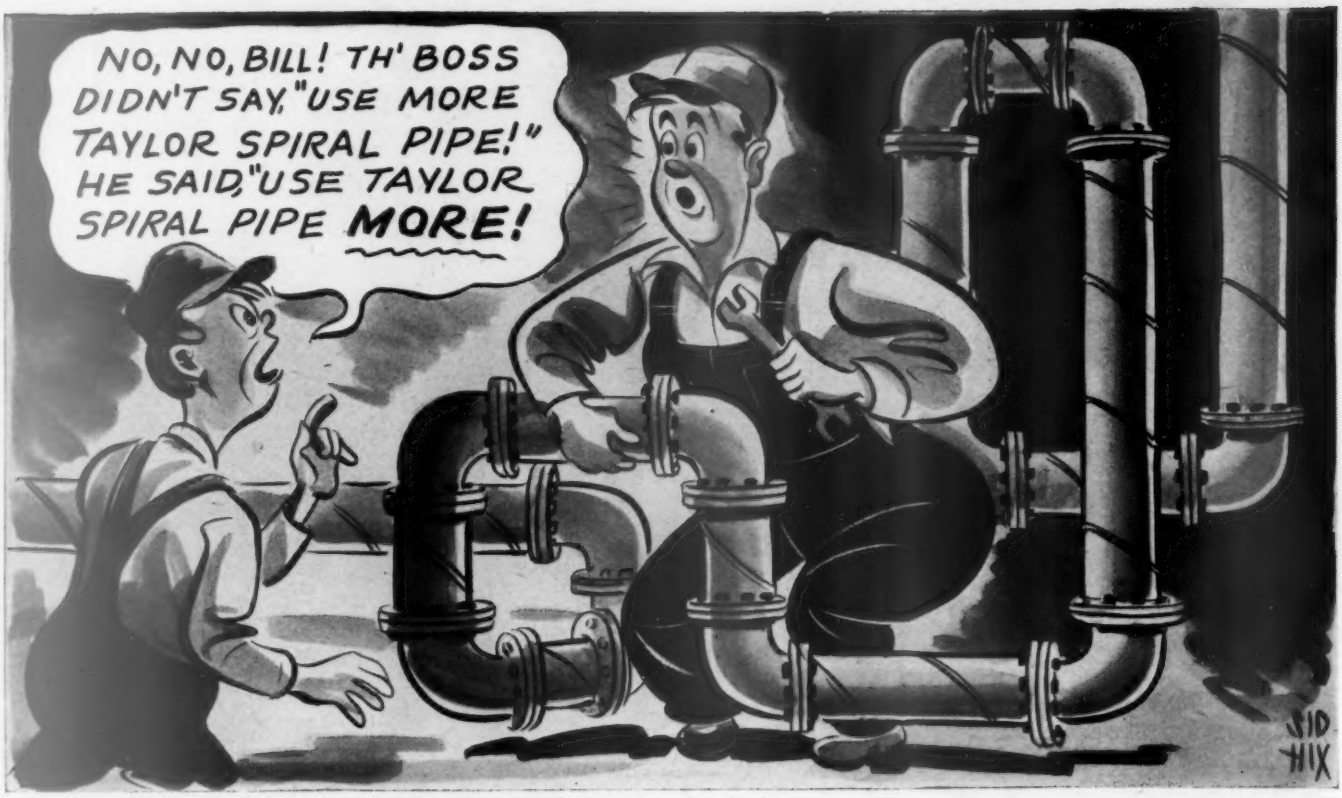
Exceptional hole cleaning ability is a "must" feature of Gardner-Denver Sinkers. In hard or soft ground, they keep the hole clean . . . permit faster footage per shift. Open the blower valve, and a powerful stream of air under full line pressure blasts every bit of material out of the hole . . . fast.

Gardner-Denver Sinkers are easy riding . . . perfectly balanced to assure the easy holding that cuts down operator fatigue. From the 31-pound S-33 to the 80-pound S-79, Gardner-Denver Sinkers help speed job progress.

* * *

For complete information on Gardner-Denver Sinkers, write for descriptive bulletins.
Gardner-Denver Company, Quincy, Illinois.

GARDNER-DENVER *Since 1859*



Anyhow, the more you properly use, the more you save—

In the interest of conserving steel and man-hours (to say nothing of money) no one can afford in times like these to use heavier pipe than is needed for the job at hand. Or to put it another way, it will pay you, whenever a piping job comes up, to make sure that you're not using heavier and costlier pipe than is needed. Too often industry *does* use heavier pipe than needed, and here's why:

The pipe ordinarily used in most plants for every-day moderate and low pressure services is Standard Thickness pipe. Since much heavier pipe is available, most people probably consider this Standard Thickness pipe light rather than heavy. But the fact remains that it is heavier than needed for a large percentage of run-of-plant uses—uses like those listed below.

In such services it is heavier than needed for the simple reason that light-but-strong Taylor Spiral Pipe has fully proved its ability to handle these every-day requirements with strength and service life to spare. Reinforced from end to end by the sound, spiral welded seam, Taylor Spiral Pipe gives you greater strength in proportion to wall thickness than any other type of pipe made. And this light weight, with ample strength, cuts the installed cost of Taylor Spiral way down—in many cases to half that of Standard Thickness pipe.

Changing over to Taylor Spiral Pipe for services like those listed is made easy by the complete range of sizes and fittings. Thicknesses range from 18 to 6 gauge; sizes from 6″ to 42″; joint lengths up to 40 ft. All types of end joints and couplings, all kinds of fittings and specials or fabricated assemblies, are produced by Taylor Forge, assuring a complete service and undivided responsibility.

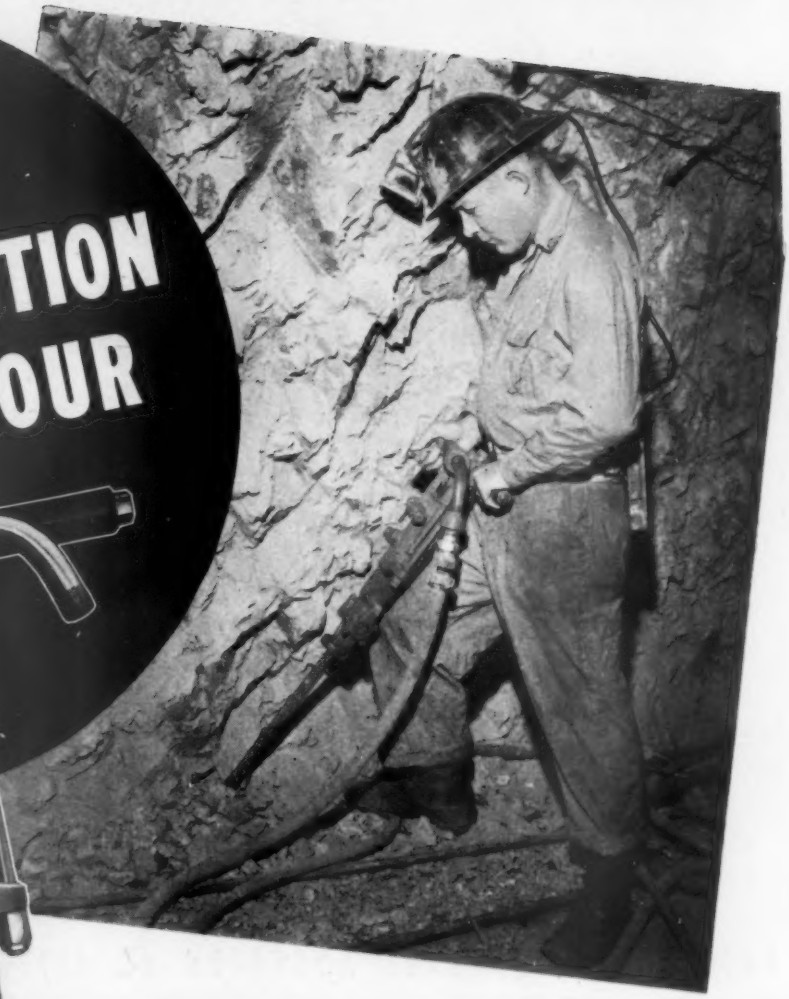
TAYLOR FORGE & PIPE WORKS

General Offices & Works: Chicago, P. O. Box 485 ★ New York Office: 50 Church St. ★ Philadelphia Office: Broad Street Station Bldg.

CHANGE TO TAYLOR SPIRAL PIPE FOR:

- High and Low Pressure Water Lines
- Low Pressure Steam and Air Lines
- Steam and Diesel Exhaust Lines
- Vacuum and Suction Lines
- Blower Piping
- Sand and Gravel Lines
- Industrial Gas Lines
- Oil and Gas Gathering Lines
- Swing Pipe
- Spray Pond Piping
- Hydraulic Mining
- Dredge Lines

MORE HOLE-PRODUCTION PER MAN HOUR



Thor

SINKER ROCK DRILLS

4-POSITION THROTTLE
gives operator complete control of drilling speed for all operating conditions.

RIFLE BAR ASSEMBLY
Time-tested, ratchet construction that assures dependable rotation.

POSITIVE AIR SCREEN
Prevents clogging of machine. Takes apart quickly for cleaning. Free flow of air.

ENCLOSED RETAINER SPRINGS
Fully enclosed, dirt-proof operating parts. Tamper proof, permanently set spring tension.

For full details, write for THOR Air Tools Catalog 42A

THOR Sinker Rock Drills have exclusive features—plenty of them . . . But none so important as their capacity to drill more rock in less time—at *lower cost* . . . No wonder they are so popular where drilling operations are checked and double-checked in terms of production figures . . . THOR Sinker Rock Drills, for wet or dry operations, range from light machines to heavy duty models for rough, tough work in difficult formations . . . One thing you can be sure of—THOR Sinker Rock Drills will step up output by any time "yardstick"—day, week or month . . . Their smooth operation and rugged construction assure long, lasting, trouble-free service at minimum maintenance cost.

Thor **MEASURED AIR MEANS THIS . . .**

- BALANCED POWER . . . because only a precisely measured quantity of air is admitted behind the piston.
- AIR ECONOMY . . . because every ounce of air which enters the machine provides its full measure of power for efficient performance.
- SMOOTH PERFORMANCE . . . because every stroke is powered by the same measured quantity of air.
- LOW MAINTENANCE COST . . . because there are no separate parts of the patented THOR Valve to get lost or wear out.

Thor PORTABLE *Pneumatic* TOOLS

Branches in Principal Cities

INDEPENDENT PNEUMATIC TOOL COMPANY
600 West Jackson Boulevard, Chicago 6, Illinois
New York Los Angeles

SINKERS • DRIFTERS • STOPERS • SAWS • SUMP PUMPS • HITCH CUTTERS

Lima Advantages:
INDEPENDENT CLUTCHES
ANTI-FRICTION BEARINGS
EXTRA BIG DRUMS
SPLINED SHAFTS
SQUARE LEVER SHAFTS

LIMA

Made for the Job..

Do not overlook the versatility of a LIMA shovel when buying excavating machinery. There are places and purposes where only a power shovel is the answer to your problem. LIMA shovels are designed to work in wet, muddy ground and tough rock digging as well as dry, loamy dirt. With a LIMA you are prepared to dig earth, rock, coal, ore, clay and many other types of material with assurance of big output regardless of the type of work. In addition to having a fast economical excavator you also have in a LIMA, a material handling crane, pull-shovel or dragline by simply changing front end equipment. When you buy for the future buy an all purpose LIMA and be prepared for any job.

Write for a free bulletin TODAY!

LIMA LOCOMOTIVE WORKS, INCORPORATED, Shovel and Crane Division, Lima, Ohio, U.S.A.

SHOVELS	CRANES	DRAGLINES
¾ YD. TO 5 YARDS	13 TONS TO 100 TONS	VARIABLE

ASPHALT - AGGREGATE ADHESION AS ALTERED BY CHEMICAL ADMIXTURE

CASE NO. 3

• NO DELAYS DUE TO RAINSTORMS..

'We sprayed a mixture composed of M. C. 2 cut-back asphalt to which had been added 1½% by volume of **NOSTRIP** upon a section of very wet gravel surfaced road with a power spray nozzle attached to a Littleford Asphalt 4 bbl. kettle. Upon this sprayed surface **in the rain** we spread ¾ inch minus broken stone uniformly, and rolled with 5 ton roller. Immediately following this operation, **still in the rain,** we repeated the process. After 24 hours . . . we covered this with stone chips as above and again rolled it. This method gives very excellent results **although carried out in the rain."**

*Above is an excerpt of a letter from a County Road Engineer in a Northwestern State. Name on request.

your first drum

is our best salesman!

THE ALL-YEAR ROAD MATERIAL

NOSTRIP

TRADE MARK REGISTERED U.S. PAT. OFFICE

AN ADMIXTURE FOR TAR AND ASPHALT

MAGUIRE INDUSTRIES, INCORPORATED • NOSTRIP DIVISION • 122 E. 42nd ST. NEW YORK, 17, N.Y.

HANSON

Crawler

EXCAVATORS and CRANES

With Hanson Crawler Excavators and Cranes you can hoist, propel, swing and steer, all at the same time. This is the exclusive Hanson feature which enables so many engineers and contractors to add that extra bit of speed *and profit* that makes the job pay out.

Put this "extra profit" Hanson feature to work on your jobs.

EXCAVATORS

3/8 and 1/2 Cu. Yd. Capacity
Full revolving — Chain crowd —
Welded steel construction — Low center of gravity.
Gasoline or diesel.

CRANES

4 and 6 Ton Capacity
Full revolving — Lattice type steel boom —
Balanced design — Low center of gravity —
Rugged — Versatile — Gasoline or diesel

CONVERTIBLE TO:

Shovel — Crane — Dragline — Pile Driver — Clamshell — Trench Hoe

Complete details in folder EC45. Write for it.

THE HANSON CLUTCH & MACHINERY CO.
TIFFIN, OHIO

BEFORE YOU BUY

. . . it will pay you to investigate the results obtained by the use of Honan-Crane Oil Purification Equipment.

★ There are too many operators who are sour on Oil Purification . . . completely disappointed with the results they are getting with cheap and inadequate oil filters and strainers.

Honan-Crane "Continuous" Oil Purifiers are constantly replacing this inefficient equipment, but such costly experimentation is the long, hard way to get good results.

We believe that if any operator or prospective purchaser will first expose himself to the value of Honan-Crane Equipment in the terms of *results attained*, he will *buy* Honan-Crane and get the kind of Oil Purification every operator wants . . . THE CONTINUOUS REMOVAL OF ALL ABRASIVES, ACIDS, SLUDGES and DANGEROUS CONTAMINATION AS FAST AS IT IS LIBERATED BY THE OPERATING EQUIPMENT.

The cost of such effective purification is very small in relation to the savings accomplished in reduced wear and lowered maintenance costs.

Write for engineering bulletins and complete information on the purification of any kind of oil.

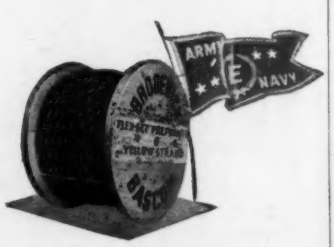
HONAN-CRANE CORPORATION
Subsidiary of Houdaille-Hershey Corp.
56 Indiana Avenue Lebanon, Indiana

Make wire rope last . . . keep it on the job

Sharing your wire rope with the armed forces doesn't mean going without; it just means taking *care* of what you have. For example, inspect it often. Lubricate when indicated. Operate at capacity, but don't overload.

When you must replace a rope, get *Preformed* Yellow Strand for heavy-duty quarry jobs. It's strong, flexible, highly resistant to kinking and fatigue—qualities that result in long rope life. Specify *Preformed* Yellow Strand for hoist and drag lines on your dragline machine . . . for holding and closing lines on clam shells . . . for hoist and swing lines and as rack and crowd ropes on power shovels. B & B engineers will gladly help you *choose* the right rope and *use* it right.

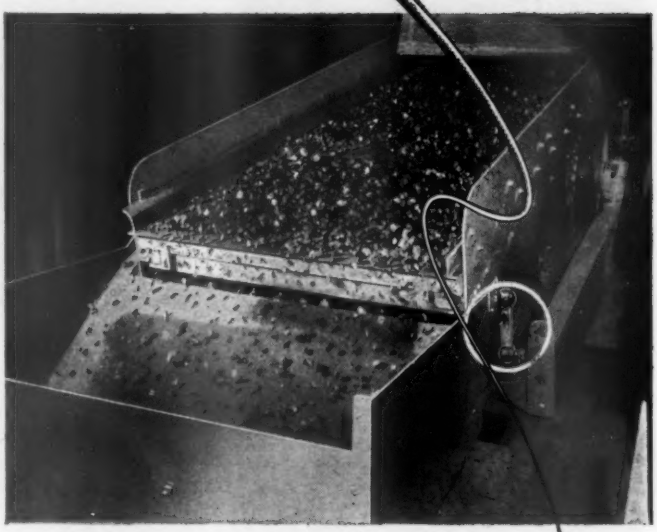
Broderick & Bascom Rope Co., St. Louis
Branches: New York, Chicago, Houston, Portland, Seattle
Factories: St. Louis, Seattle, Peoria



YELLOW STRAND

PREFORMED WIRE ROPE

SECO'S *Sharper Whip*

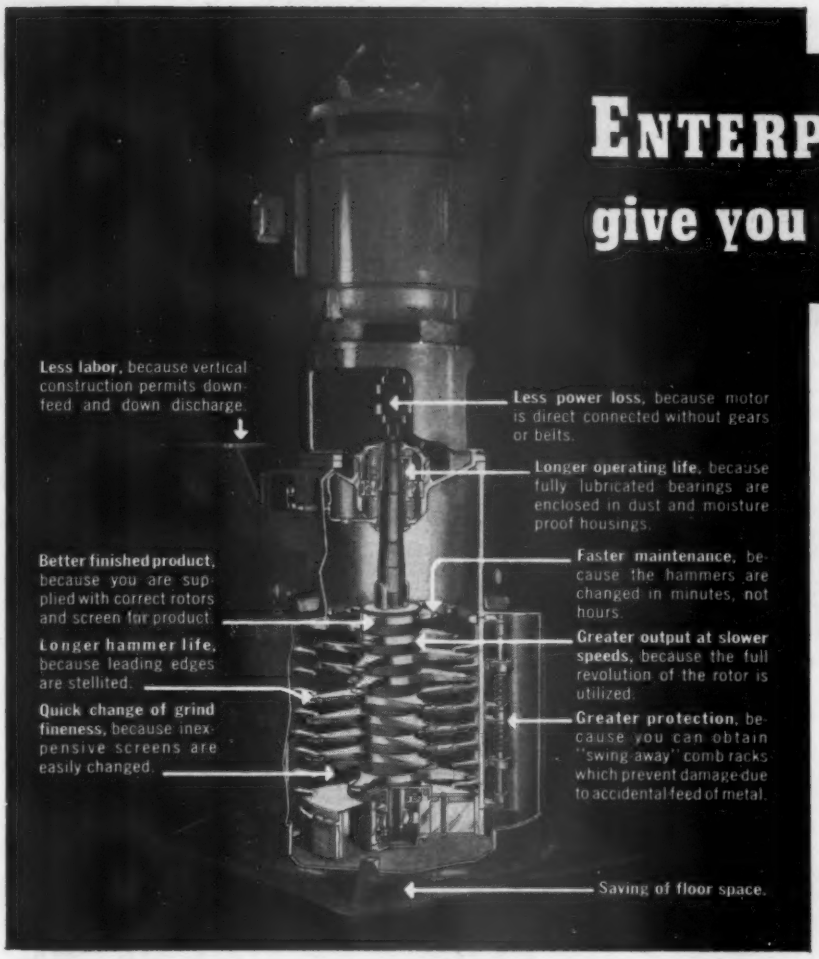


Pays Off by Screening More Tons Per Hour

Operators everywhere are reporting increased tonnages screened with Seco Vibrating Screens. That's because Seco's patented method of connecting the live body to the base frame enables a fully controlled, circular motion that is evenly distributed over the entire screen surface. Thus, materials are driven more quickly and more thoroughly through the meshes no matter how the load is distributed. Over 200 models to choose from. Send Seco screening experts your screening problem today. Write Dept. A.

SECO SCREEN EQUIPMENT CO., INC.
9 Lafayette Avenue, Buffalo 13, N. Y.

ENTERPRISE Vertical Mills give you lower cost grinding


Less labor, because vertical construction permits down-feed and down discharge.
Less power loss, because motor is direct connected without gears or belts.
Longer operating life, because fully lubricated bearings are enclosed in dust and moisture proof housings.
Better finished product, because you are supplied with correct rotors and screen for product.
Faster maintenance, because the hammers are changed in minutes, not hours.
Longer hammer life, because leading edges are stellited.
Greater output at slower speeds, because the full revolution of the rotor is utilized.
Quick change of grind fineness, because inexpensive screens are easily changed.
Greater protection, because you can obtain "swing away" comb racks which prevent damage due to accidental feed of metal.
Saving of floor space.

A single mill handles up to 8 tons of asbestos rock per hour . . . continuous operation

Only Enterprise Vertical Mills offer you all of these benefits

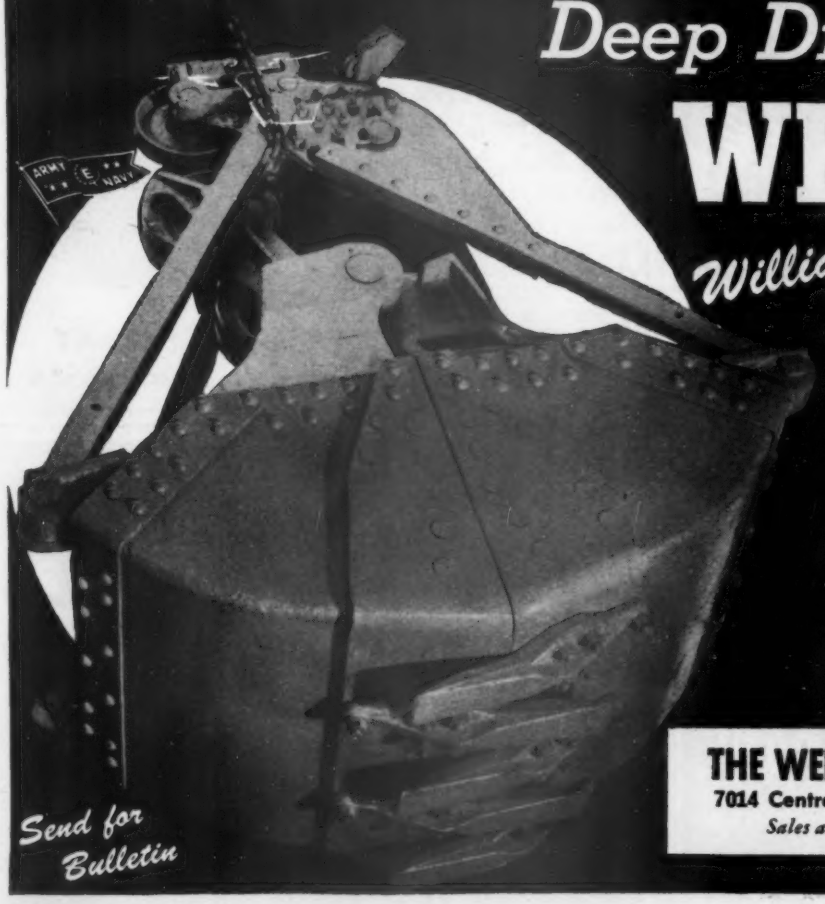
There is an Enterprise Vertical Mill to meet your specific needs of grinding, macerating, shredding or pulping. For complete information on the many types of rotors and accessory equipment available with Enterprise Vertical Mills, write today to Dept. P-10

PROCESS MACHINERY DIVISION
OF ENTERPRISE ENGINE & FOUNDRY COMPANY
Mills . . . Presses . . . Cookers . . . Dryers
18th and Florida Streets • San Francisco, California

Deep Digging . . .

WELLMAN

Williams Buckets



Wellman Buckets, in Power Arm and Multiple Rope Types develop great digging power. They bite into frozen ground, hard clay or shale, and come up with full loads.

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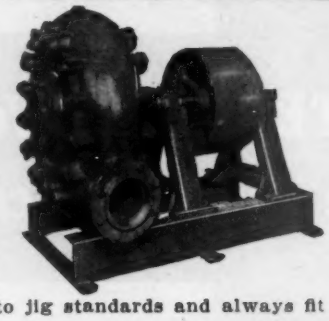
Sand and Gravel Pumps

HEAVY-DUTY
(Ball-Bearing)
and Low Head Types



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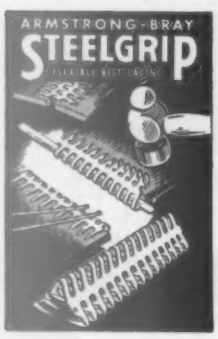

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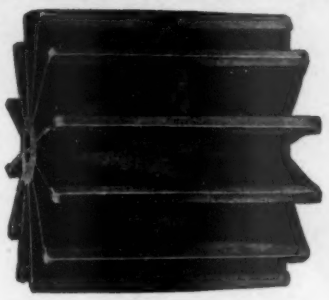

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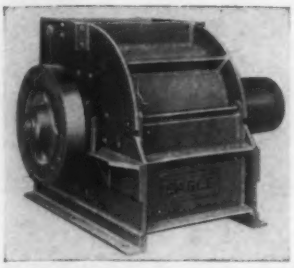

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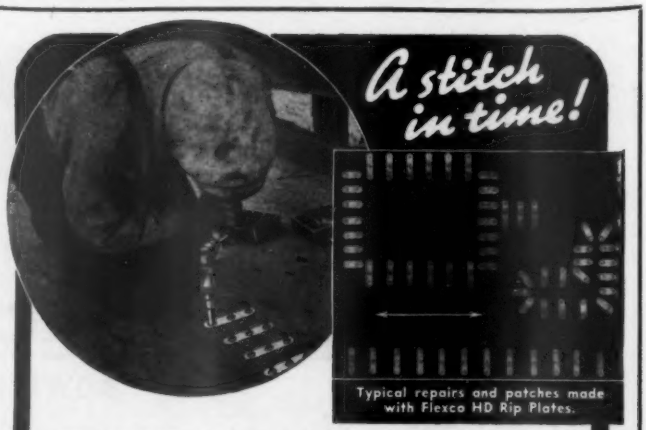

Typical repairs and patches made with Flexco HD Rip Plates.

THOUSANDS of men in industrial plants, mines and mills all over the country are doing just what this man is doing. They are cutting costs by repairing conveyor belts with Flexco HD Rip Plates.

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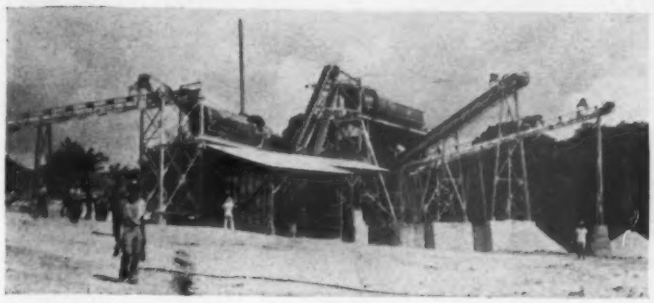

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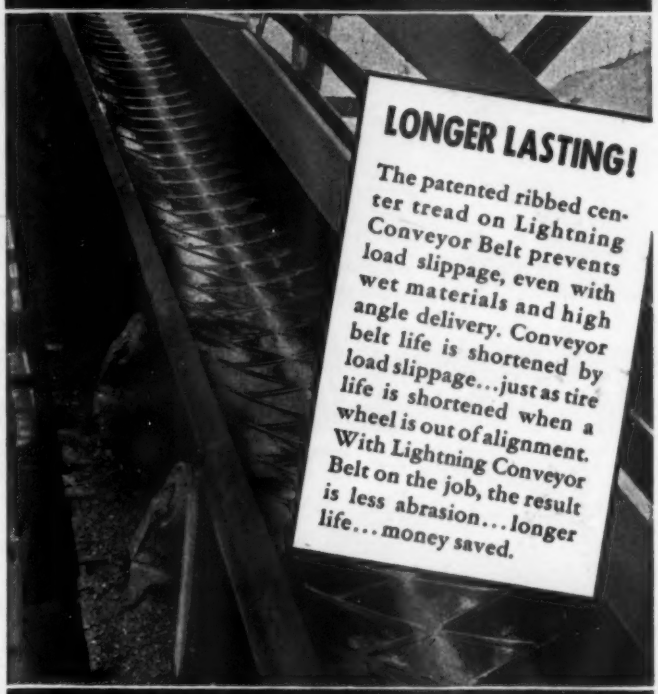
Lightning RIBBED CENTER CONVEYOR BELT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RELIABLE

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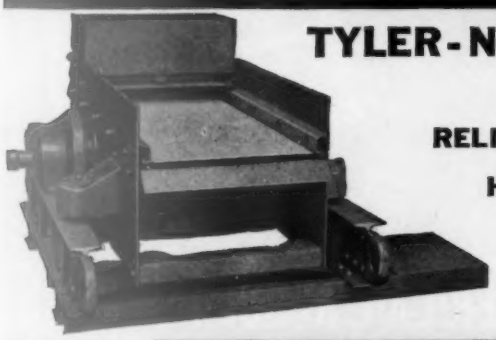

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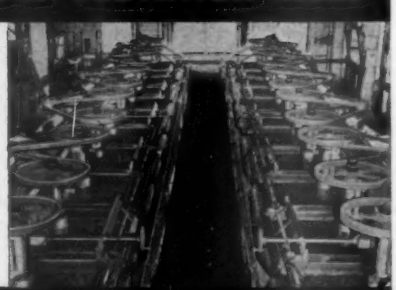

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McCully 6″ Finishing Crusher
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WANTED

Quarry Superintendent, Assistant Superintendent for established midwest plant, operating year around, at once.

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Contractor to crush and stock pile 100,000 yds. stone for road contract.
95' face—Own quarry.
Permanent set up.
Unlimted quantity. Passes Highway and U. S. specifications.
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CORE DRILLING ANYWHERE

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Quarries
Crushing Plants
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WANTED

PLANT SUPERINTENDENT

By leading producer crushed limestone located middle west. Product serves the chemical, metallurgical and construction industries. Excellent post war prospects.

Applicant must have broad experience and training in production and be capable of the direct supervision of all operations including maintenance of an organization for plant producing in excess of million tons annually.

Give complete history in first letter: age, education, family, experience by years, when available, references. References will not be contacted until after interview.

• • •

Box 409 c/o Pit & Quarry
538 South Clark St., Chicago 5, Illinois

WANTED AT ONCE — (ESSENTIAL WORK):

Two Cinder Block Production Foremen for Southern Plant operating Joltcrete machines. Good working and living conditions. Splendid future for persons qualifying. Give age, experience, education, and complete information in first letter. Interview at our expense will be arranged for persons with qualifications to fill these positions. All replies will be held in strictest confidence.

Reply Box 518, c/o Pit & Quarry
538 So. Clark Street, Chicago 5, Illinois

2—No. 200 Rex double pumpcretes, excellent condition, with Waukesha 6-cylinder gas engines complete with pugmill remixers and 1,200 ft. 8" pipe.

2—30B Diesel driven caterpillar cranes with dragline and shovel attachments.

1—No. 480 Marion steam crawler crane without attachments.

1—Complete I-R No. 54 drill steel sharpener with one 27F oil furnace, one JF furnace, one shank and bit punch, cut-off machine, etc., etc., in guaranteed condition.

1—5 Cubic yard Owen clamshell bucket—weight 27,000 lbs.

GREAT LAKES DREDGE & DOCK CO.
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Jaw Crushers—4"x8" up to 18"x36".
Crushing Rolls—16"x10" up to 54"x24".
Gyratory Crushers—No. 3, No. 12.
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Direct Heat Rotary Dryers—3½'x25', 4'x30', 5½'x40', 6'x50', 7'x50'.
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Cement Kilns—3' up to 11' diameter.
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Tube—Rod and Ball Mills—3' to 6' diameter.
Vibrating Screens—Air Separators.
Lime hydrating plant.
New Dryers built for all purposes.

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CRUSHERS - ELEVATORS
SCREENS - CONVEYORS

1—New 9" x 15" Beaumont Jaw Crusher
2—Used 9" x 15" Champion Jaw Crushers
1—10" x 20" Champion Jaw Crusher
1—12" x 20" Buchanan Jaw Crusher
3—12" x 26" Champion Jaw Crushers
1—4½" Traylor Gyratory Crusher
1—No. 2F Telsmith Gyratory Crusher
2—New Small Hammer Mills.

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Lansdowne, Pennsylvania

FOR SALE

Immediate shipment. Five Allis-Chalmers tube mills 5' x 22", chilled iron liners, steel heads, good condition.

●

KOSMOS PORTLAND CEMENT CO.
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LOCOMOTIVES

1—6-Ton Gas Locomotive, 36" Ga. Milwaukee Locomotive Works
1—10-Ton, 0-4-0 Davenport, Diesel
1—30-Ton, 0-4-0 Davenport, Diesel
1—35-Ton, G. E. Electric Locomotive, 250 Volt, D.C.
1—50-Ton, 0-6-0 Vulcan Locomotive
2—60-Ton, Baldwin-Westinghouse Electric Locomotive, 1500 D. C., New 1927
1—60-Ton, Westinghouse Electric Locomotive, 550 volt, D. C.
2—60-Ton, Baldwin-Westinghouse Electric Locomotives, 1500 volt, D. C.
2—85-Ton, GE Electric Locomotives, 600 volt, D. C.
1—70-Ton, 0-6-0 Baldwin
1—80-Ton, 0-6-0 Lima Switching Locomotive, T. E. 35,300# Built 1925. Excellent condition.
1—50-Ton, 0-6-0 Baldwin saddle tank loco.
1—80-Ton, 0-6-0 American saddle tank loco.

IRON & STEEL PRODUCTS, INC.
13406 S. Brainard Avenue, Chicago 33, Illinois
"ANYTHING containing IRON or STEEL"

CRUSHING PLANT

1—Size 1020 Good Roads portable, crusher Champion, size 10x20", 26' bucket elevator, revolving screen, 30-ton hopper, gasoline powered.

AIR COMPRESSORS

Portable and stationary, belt with elec. or gas power sizes from 20 cu. ft. 1,000 cu. ft.

CRUSHERS

1—No. 2 Climax jaw crusher, size 9x16".
1—Buchanan jaw crusher, size 10x16".
1—Acme jaw crusher, Ser. No. 1873, size 12x20".
1—Acme jaw crusher, Ser. No. 1686, size 9x16".
1—No. 3 Champion jaw crusher, size 7½x13".
1—United Iron Works, "Blake-type" jaw crusher, size 9½x24".
1—No. 9 New Holland jaw crusher, size 6x9".
1—Sawyer Massey jaw crusher, size 9x18".
1—Allis Chalmers No. 5 gyratory crusher. Ser. No. 5331, opening 10x38".
1—Austin No. 5 gyratory crusher, Ser. No. 2945, opening 12x35½".

DERRICKS

2—20 ton American steel guy derricks. 1—110' mast, 100' boom; 1—100' mast, 90' boom.
3—Steel guy Derricks; 1—15 ton American steel derrick, 83' mast, 75' boom. 1—5 ton Terry Guy Derrick, 70' mast, 60' boom. 1—5 ton Insley, 75' mast, 80' boom. Stiff leg derricks; 1—25 ton Hunter, 40' mast, 80' boom. Also a number of wood stiff leg derricks, 1 to 5 ton cap.

HOISTS (Electric, Gas, Steam)

85—Electric, ranging from 30 H.P. up to 125 H.P. consisting of triple-drum, double-drum and single-drum, with AC or DC motors, some with attached swingers. Following makes: American, Clyde, Lambert, Lidgerwood and National.

Gas hoists ranging from 8 to 120 H.P., single, double and triple-drums; all standard makes (38 in stock).
Steam, ranging from 8 H.P. to 60 H.P. single, double and triple-drum; all standard makes.

PUMPS (Elect. Centrifugal)

HORIZONTAL:

1—10x8" Weiman-Jaeger No. P-4201, power 50 H.P. AC motor capacity 2500 GPM @ 35' head.
7—8x6" Worthington, 4 stage, No. 676005W, without power. Capacity 900 GPM @ 875' head.
1—8x8" Worthington, No. 816521, power 50 H.P. AC motor. Capacity 2000 GPM @ 30' head.
1—6x6" Morris, No. 109098, power 100 H.P., 2200/60/3 slip ring motor. Capacity 1200 GPM @ 240' head. Shut off head 270'.
1—6x5" Fairbanks-Morse pump No. 441649, combination gas and electric power, one end Buda engine, other end 50 H.P. AC electric motor, operate either power. Capacity 1000 GPM @ 150' head.
1—6x6" Deming pump No. DC41411, power 25 H.P. AC motor. Capacity 1000 GPM @ 70' head.
1—6x6" Allis-Chalmers No. 5418, power 40 H.P. AC motor. Capacity 1000 GPM @ 50' head.
2—6x5" Union pumps, No. 174832, 174415, power 20 and 15 H.P. AC motors. Capacity 650-750 GPM @ 90-40' heads.
1—5x4" Dayton-Dowd pump No. 4713, power 10 H.P. AC motor. Capacity 500 GPM @ 40' head.
3—5x3" Ingersoll Rand pumps, 2 stage No. 79574, 79575, 80252, power 100 H.P. AC motors. Capacity 525 GPM @ 500' head.
1—5x4" Dayton-Dowd pump, No. 4713, power 10 H.P. AC motor. Capacity 500 GPM @ 40' head.
1—4x4" LaBour No. 4738, power 20 H.P. AC motor. Capacity 400 GPM @ 90' head.

DREDGING

1—10x10" Morris, size 10A, No. 86864, capacity 87 cu. yds. per hr.
1—8x8" Cataract, No. 175895, capacity 2000 GPM @ 25' head.
1—8x8" Morris dredging pump, capacity 60 cu. yd. per hr.
1—4x4" Hetherington & Berner, power 25 H.P. AC elect. motor, capacity 450 GPM.

Equipment seldom fails when help is near. To make sure yours is dependable, use E. C. A. REBUILT equipment — guaranteed against defective parts.

PARTIAL LIST ONLY — SEND FOR 48 PAGE STOCK LIST

All this equipment is owned by us and may be inspected at one of our plants. WE BUY—REBUILD, SELL AND RENT.

CHICAGO 12, ILL. 1160 S. Washtenaw Ave.
PITTSBURGH 30, PA. P. O. Box 933 Dept. PQ
PHILADELPHIA 2, PA. 1513 Race St.
NEW YORK 7, N. Y. 30 Church St. Dept. PQ

EQUIPMENT CORPORATION of AMERICA

FOR SALE

1—Model 100 B Bucyrus Erie combination shovel, dragline
1—Practically new 30 ton spur model BB Yale Towne chain fall
1—Model 120 Bucyrus Erie combination electric powered
1—Whitcomb 6 ton gas locomotive
1—American 40 ton locomotive standard gauge, retubed 1943
1—210 cubic foot Davey air compressor mounted on truck
1—T20 International tractor
1—TD18 International Tractor; 1941 model with Bucyrus Erie S90 Scraper guaranteed
1—P&H model 206 crane, good condition
1—RD8 tractor with LeTourneau U18 Carryall scraper and pcu
1—RD7 tractor with LeTourneau 10 yard scraper, pcu and 12" angledozer attachment
1—RD7 tractor with LaPlante Choate angledozer
1—TD40 tractor, angledozer and power control unit
1—TD6—1945 model A-1 shape

All above equipment in good condition ready for immediate shipment.
Phone, write, or wire:

GARSON IRON AND STEEL COMPANY
512 Lyceum Bldg., Duluth 2, Minn. Phone: Melrose 222

FOR SALE
ALL OR IN PART

Sand and Gravel Plant Including Jaw Crusher, Gyratory Crusher, Conveyors, Vibrating Screens, Sand Classifiers, Extra Heavy Scrubber, Water Pumps, Sand Pumps, Feed-O-Weights, Weightometers, Trestle and Tripper and Auxiliary Equipment.

Also

Approximately 9 Miles of Conveyor Complete with Belting, Pulleys, Troughing and Return Idlers and Drive Equipment.

All Offered Subject to Prior Sale.
For Particulars Write

COLUMBIA CONSTRUCTION COMPANY, INC.
Box 579, Redding, California Tel. Redding 1449

FOR SALE

One Industrial Steam Locomotive Crane.
One 1 cu. yd. Northwest Combination Crane and Shovel.
One 1 cu. yd. Northwest Electric Shovel.
One American Twin Drum Dragline Hoist, 60 HP Waukesha Motor.
One 50 ton Steel Bin.
One 8 x 36 Hi-way Portable self propelled Crushing Plant, 100 HP Waukesha Motor.
125 HP Waukesha Power Unit, clutch and pulley.
One 10 x 36 Pioneer Crushing Plant with Rolls and Conveyors.
One Model K-1 Link Belt Crane, 50 ft. Boom, Clam and Dragline Buckets—1 cu. yd.

FURTON BROTHERS CONSTRUCTION COMPANY
North State Street, Menominee, Mich.

..... Keeping COSTS Down ..."

This great issue of PIT & QUARRY indicates the outstanding interest of Quarry Men in COSTS.

A valuable factor in *Reducing* Costs of heavy construction work is the Coast-to-Coast service of ECONOMY COMPANY. Through our Nation-wide contacts we have made a valuable selection of Power Shovels, Cranes and Draglines,—as well as numerous attachments, buckets (both clamshell and dragline) and a great variety of HAULING EQUIPMENT, including both trucks and tractors.

While the lists below are only partial, being limited by space, they give some idea of the various types of equipment on hand. To get full details, including prices and location, phone or wire us. We will gladly arrange an inspection of any equipment listed.

REAL BUYS IN SHOVELS AND DRAGLINES

3½ yd. shovel with 75' boom and 48' dipper stick—3½ yd. dipper bucket—Model 175B Bucyrus-Erie—$20,000 has been spent by one of the largest fuel concerns on this steam shovel to put it in real good condition, and they are offering it for sale for $10,000. This is the greatest bargain we know of and we recommend it be investigated promptly.
1—4 yd. combination shovel and dragline—105' dragline boom in 4 sections—32' shovel boom—4 yd. dipper bucket and 4 yd. dragline bucket—Model 100B Bucyrus-Erie—price attractive.
3—½ yd. Monighan Walker dragline with 100' boom. This machine has been rebuilt entirely. New type crawlers. Brand new boom and brand new 200 HP Fairbanks-Morse diesel engine. It will pay you to investigate this machine.
A COMBINATION. One 3 yd. Monighan diesel dragline powered by Cummins 200 HP diesel engine, 90' boom and one 1 yd. General loading shovel. Both machines can be purchased at an attractive price.
1—3 yd. Marion 40A diesel dragline—95' boom—a Waukesha diesel engine.
1—15 yd. Bucyrus-Erie tower machine—ideal for stripping work on level ground.
1—7 yd. Bucyrus-Erie 175B shovel with 65' boom and 42' dipper stick.
2—5 yd. Bucyrus-Erie 120B shovel and dragline combination — dragline boom 80' (could be extended) 4 and 5 yd. dipper buckets and 5 yd. dragline bucket.
1—4 yd. Marion Model 4160 shovel—electric powered—34' shovel boom—24' dipper handle.
1—4 yd. Marion Model 37 electric shovel.
2—2½ yd. Marion Type 125 electric shovels.
1—diesel 2½ yd. shovel and dragline combination—2½ yd. dipper bucket—2½ yd. dragline bucket—ready for immediate shipment. Bucyrus-Erie Model 48B—Price $23,500. Freight prepaid to any part of the United States.
1—43B 2 yd. Bucyrus-Erie dragline rebuilt and one 2 yd. Bucyrus-Erie 43B shovel.
1—2 yd. 50B Bucyrus-Erie diesel shovel and dragline combination at a bargain price.
1—2½ yd. Marion electric shovel.
1—8 yd. steam dragline with 165' boom—Bucyrus-Erie make.
1—4 yd. Bucyrus-Erie steam shovel on cats—general condition exceptionally good—Price right.
1—3½ yd. Marion steam shovel with 65' boom—40' dipper stick—ready for immediate shipment.

In additon to the above we have quite a selection of small, medium and large shovels and draglines. WRITE, WIRE or PHONE to us immediately, and we will supply any additional information you require, or present a detailed description of any other equipment you might be interested in.

DUMP TRUCKS and TRAILERS

12—24 yd. White Rear Dump Trucks built in 1939
2—21 yd. Euclid diesel bottom dump trucks Model 5LDT
3—18 yd. Model 4LDT Euclid diesel bottom dump trucks
3—20 yd. Six-wheel diesel Maxi two-way side dump trucks model 140
18—13 yd. Euclid diesel bottom dump trucks, 3 Model 17FDT, 6 FDT, 5 are 25FDT
3—14 yd. Oshkosh "Eartmovers" Model RXC with 128 HP engines with semi-trailers 10 yd. water level capacity or 14 yd. heap
2—12 yd. Euclid end dump trucks diesel Model FD
8—8-12 yd. 1942 diesel Federal Dump Tractors and Trailers Model 29—8 yd. water level
5—12 yd. Euclid Bottom Dump gas trucks Model WCL
2—12 yd. International Dump trucks Model DR-70 gas
2—Autocars 12 yd. Dump bodies
6—11 yd. Sterling Rear End Dump Trucks Model HCS
4—8-12 yd. Euclid Bottom Dump Trucks
3—10 yd. Euclid diesel bottom dump trucks
5—9 yd. Euclid diesel bottom dump trucks
2—8 yd. Sterling Model DC and 140 dump truck
6—4½ yd. General Motors Dump and Cab trucks gas
3—15 ton Model LZWCL Euclid Gas Bottom Dump truck Tractors
18—Heavy duty International dump and Supply trucks
4—6 yd. A6 International Dump trucks with sideboards
6—1937 6-10 yd. Heavy-duty Mack dump trucks — special rock body
1—AC 5-ton Mack Dump Truck
1—1937 5 yd. E. H. Mack dump truck
4—5 yd. HD140 Sterling dump trucks
2—5-6 ton Chevrolet dump trucks
2—5 yd. White 702 dump trucks
1—4 yd. 10S Ateco Hydraulic Dirtmover
2—4 yd. 1937 Mack trucks
1—5 yd. Studebaker dump truck
18—4-5 yd. 1942 New Ford Dump Trucks with Thornton tandem drive
4—12 yd. Model FDT diesel Bottom Dump Euclids
2—Model 120 Koehring trail dumps diesel
1—3½ ton Mack truck
1—3 yd. 1939 International Model D-30 dump trucks
1—3 ton 1940 Ford 10 yd. tailgate—8 yd. sides
1—3 yd. 1939 Chevrolet
3—2 yd. Studebaker Chassis complete with Dempster-Dumpster unit—equipped with five 2 yd. buckets
1—2 yd. 1940 Chevrolet Dump truck
1—2 ton White Dump Truck
1—1½ ton International Dump truck
1—1½ ton 1939 D-30 International truck

One Lot of 2-2½ ton dump trucks—one 1940 2½ ton Brockway—one each 2 ton Brockway, International, Reo and Autocar

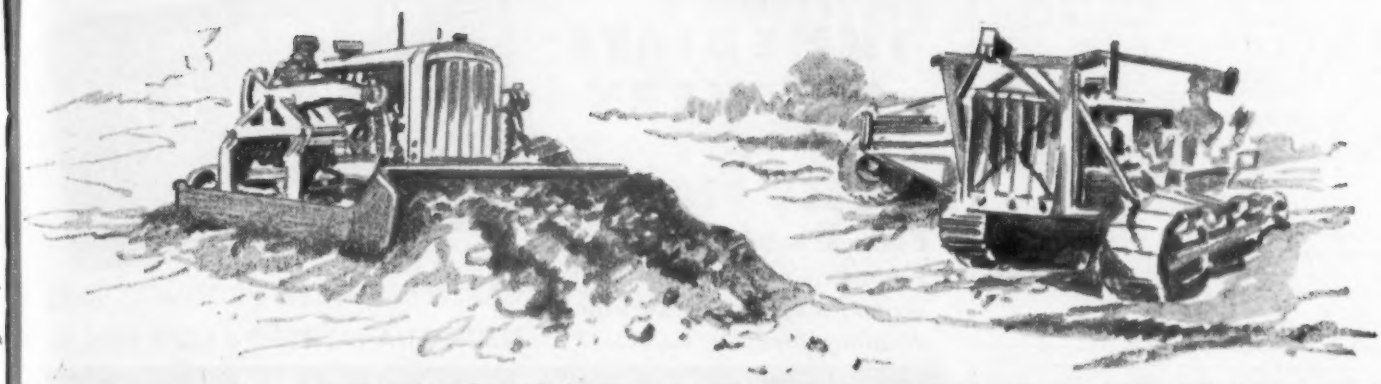
One Lot of Ford Dump Trucks—one 1942 Ford, 5 1941 Ford, 4 1939 Ford all 1½ ton and one 2 ton Ford dump trucks

One Lot consisting of one each 2 ton 1937 White Dump truck, 5 yd. 1939 Ford Dump truck, 5 yd. GMC 1938 dump truck, 4 yd. 1937 Chevrolet 4 yd. 1935 Ford and ½ ton 1936 Ford pickup dump truck

KOEHRING DUMPTORS

3—5 yd. Koehring Dumptors Model W55
3—5 yd. Koehring Dumptors gas
2—5 yd. Koehring Dumptors Model 55
1—1940 Koehring Dumptor 7 yd.
2—10 yd. TD-120 Trail Dump Koehring Tractors and Wagons

ECONOMY COMPANY INC.
NEW YORK



...with ECONOMY COMPANY

TRAILERS

1—low bed trailer 12 tons with Chevrolet Tractor
1—Standard low bed semi-trailer Model LOB 33
1—Herman dump trailer
1—8 ton 20' boom trailer crane
1—Caterpillar 60 logging cruiser
1—International truck with a Fruehauf trailer 30-40 ton
1—Mack tractor with Rogers 40 ton low-bed trailer
1—Mack Tractor and Rogers semi-trailer
1—18 to 22 ton pneumatic tired low-bed machinery trailer
1—1941 Fruehauf 14' dump trailer 15½ yd. capacity Model Y214
1—Diamond T 60 ton trailer and tractor
1—Federal Tractor and dump trailer
4—tool trailer shop made—1000# capacity
1—single axle Wentwin Trailer log bunks
1—35 ton Williams trailer
1—Tresco trailer
1—Rogers trailer 40-50 ton
1—1928 Fruehauf trailer
1—15 ton Rogers Trailer Model 4-GN-15
1—10 wheel C-55 International Tractor with semi-trailer—25 ton capacity
6—7 yd. Insley dump trailers
1—1938 Martin semi-trailer
1—Martin 1937 tandem semi-trailer
1—AC Mack 5 ton dump truck
2—Athey Model E-12 bottom dump trailers
1—ES7 International tractor and dump trailer

In addition to the above itemized listing, we can probably take care of every one of your requirements of any type of equipment and it will be to your advantage to forward your inquiries to us, or call us on the phone for prompt action.

TRACTORS

2—Caterpillar D-8 tractors with 15 yd. scrapers and double drum power control units
1—RD-8 tractors with LaPlant-Choate hydraulic bulldozer—near New York City
1—RD-8 Caterpillar tratcor with angledozer, double drum Hyster winch, "A" frame and 15' boom — reasonably priced
1—RD-7 Caterpillar tractor with LaPlante-Choate hydraulic bulldozer — rebuilt guaranteed condition $4900. Albany, New York, location
2—RD7 tractors with LaPlant-Choate hydraulic bulldozers—rebuilt $5250, each
4—RD6 Caterpillar diesel tractors with LaPlante-Choate hydraulic bulldozers. Reasonably priced.
1—D4 Caterpillar tratcor built in 1940 rebuilt

1942—TD-18

Two International TD-18 diesel tractors—released from factory in September 1942 are ready for immediate shipment. Reasonably priced.

6—Model 60 Caterpillar tractors with bulldozers
2—Model 50 Caterpillar tractors with bulldozers
3—Model 30 Caterpillar tractors with bulldozers
2—Model 75 Caterpillar tractors with LeTourneau double drum power units and scrapers
2—Model 20 Caterpillar tractors
1—Model 15 Caterpillar tractor

INTERNATIONAL TRACTORS

2—TD18 International diesel tractors built in 1942
3—TD14 International diesel tractors
2—TD 9 International diesel tractor
1—TD40 International diesel tractor with Bucyrus-Erie bulldozer
1—TD35 International tractor and angledozer

ALLIS-CHALMERS

2—Allis-Chalmers HD14 tractors — 1942 models with scrapers
2—Allis-Chalmers HD10 diesel tractor with Baker bulldozer
2—Allis-Chalmers HD7 tractors with Baker hydraulic bulldozers
5—Allis-Chalmers Model K tractors with angledozers
4—Allis-Chalmers Model L tractors with bulldozers
3—Allis-Chalmers Model S with Baker bulldozers

CLETRAC

2—Cletrac tractors with front end loaders
3—Model FD90W Cletrac tractors with Heil scrapers
1—Cletrac Model DGH with Garwood angledozer
2—Cletrac Model 40 tractors with bulldozers

A complete line of tractors with pneumatic tires. Further information on an yof the above listed tractors, or others you might be interested in will be gladly given.

Two 2½ yd. diesel shovels and draglines for sale.

Excellent buy. Wire, or phone.

TRUCK CRANES

1—15-18 ton Lorain truck crane
1—12-15 ton diesel Bay City truck crane
1—12-15 ton Lorain 40 truck crane specially constructed
1—7½-9 ton Bay City Truck Crane Model 16
1—12-15 ton P&H Model 400 truck crane
1—7½-9 ton P&H truck crane Model 203

2—2½ DIESEL LINK BELT DRAGLINES

One built in 1939 and the other in 1935. One has a brand new D-17000 Diesel Engine. Both have Speed-O-Matic Controls — High Gantries — 33" crawlers and all other modern attachments. Both are exceptionally good buys.

1—½ yd. Michigan Truck Crane and Shovel combination with backhoe and bucket
2—10-12½ ton Bay City truck cranes—one is a type RS and the other type R
1—7½ ton Orton truck shovel and crane combination
1—6 ton Speeder truck crane
1—12 ton P&H Model 300 truck crane

4 YD. SHOVEL AND DRAGLINE

100B Bucyrus combination shovel and dragline with 4 cu. yd. dipper bucket and 4 cu. yd. dragline bucket—105' dragline boom in four sections. Westinghouse Electric Motors. An exceptionally good buy for $44,000.

1—6½-8 ton Thew Truck crane
3—5-6½ ton Universal truck cranes

FOR LEASE

2—Lorain Model 40—10 wheeler Truck Cranes
1—P&H Model 255

TRUCK CRANES ON WEST COAST

1—P&H Model 400 specially constructed Mack truck
1—Universal on 6-wheeler specially constructed AC Mack truck
1—Universal ⅝ yd. truck crane
1—Speeder Shovel and Truck Crane combination

1 yd. NORTHWEST Model 4 Shovel $7300.

Exceptionally good buy.

¾ Yd. Lorain Model 40

Built in 1940

shovel, crane and skimmer attachments 30" cats. Chain crowd. Ready for immediate shipment.

SPECIALS

1½ yd. diesel Lorain 77—built in 1939 shovel and dragline combination clamshell bucket—real buy.

1½ yd. Link-Belt Model K2 shovel and dragline—dragline combination. Clamshell bucket—real buy.

1½ yd. Link-Belt Model K2 shovel and dragline—65' boom, 1½ yd. dipper bucket and 1½ yd. Hendryx dragline bucket, Buda engine $9700. — recommend quick action.

1½ yd. Northwest Model 6 dragline—60' boom. Priced right.

1½ to 1¾ yd. diesel dragline, 60' boom. Late Model namely a P&H 705, powered by an Atlas diesel engine. It has two heavy duty buckets and a great deal of spare parts. Condition like new. Koehring diesel shovel and dragline combination —rated 1¾ yd. Priced way under the market.
Two—2½ yd. Link-Belt diesel draglines.

49-A Vanderbilt Ave., N.Y.C.

TELS. MURRAY HILL 4-2294, 4-2295, 4-2296, 4-2893, 4-2844, 4-8292

FOR SALE

SAUERMAN ONE YARD DRAG SCRAPER COMPLETE WITH DOUBLE DRUM HOIST, ROPES AND BLOCKS.
EXCELLENT CONDITION
Kentucky Clay Mining Company
Mayfield, Kentucky

FOR SALE

Dolomite, limestone, limestone beach gravel. Drummond's Island, Chippewa County, Michigan. For purifying iron ores, road material, concrete and the making of magnesite.

W. F. Cooper
332½ No. Washington Ave., Lansing 30, Michigan

FOR SALE

Used Railroad Track Scale, 100 ton 60' Weighrail. No. 4 style, 6 section Howe track scale with recording beam and steel beam box.

Address, Mr. W. A. Fitzgerald, P. A.
St. Louis Car Company
8000 N. Broadway St. Louis, Missouri

One—24x36 Ledgerwood Hoist—Double Drum
One—Western Double Drum Hoist—36"x30" rear drum, 24"x30" front drum
One—Fabricated Steel Mast—48" sq.—100' high
One—8" American Manganese Steel Sand pump

Priced $2000.00 for lot.
ARIZONA SAND AND ROCK COMPANY
So. Seventh St. and Riverbank, Phoenix, Arizona

FOR SALE

Concrete Mixer, Smith 56S, Tilting type, 2 cu. yd. capacity. Condition excellent.

E. E. FORT
1119 So. 56th St. Philadelphia 43, Pa.

FOR SALE

3—Model F Euclid bottom dump units with Cummins Diesel engines.
3—Model K Euclid bottom dump units with Cummins Diesel engines.
1—Model K as above except Waukesha gasoline engine.

CHENEY-WRIGHT CO.
Box 209, Quincy, Illinois

Two (2) Besser Super K Tampers

Multiplex Concrete Co., Inc.
East Orange, New Jersey

FOR SALE

8 Side Dump Koppel Cars, 9' x 6'6" x 26" Bodies. Cars recently placed in first-class operating condition.
Selling Price $200 per Car.

THE NEW ENGLAND LIME COMPANY
260 Columbia Street, Adams, Mass.

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ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers	Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"	20"	5	1/8"	1/32"
42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
24"	4	1/8"	1/32"				

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

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ENDLESS "V" BELTS

"A" WIDTH All Sizes | "D" WIDTH All Sizes
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	25 "	7.50
	35 "	10.50
	40 "	12.00
1½"	50 "	15.00
	25 "	10.00
	35 "	14.00
	50 "	20.00

AIR HOSE

I.D. Size	Length	per Length	Couplings
½"	25 feet	$5.00	$1.50 Pair
	50 "	10.00	1.50 "
¾"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1"	25 "	10.00	3.50 "
	50 "	20.00	3.50 "

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1—190 Ft. belt conveyor—gear driven on head pulley, 14" belt 60% new—mounted on steel rails.$550.00
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6x8 Continuous Febble Mill.
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14 ft., 8 ft. and 12 ft. Separators

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36x60 Fairmont Single Roll.
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10x8, 13x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 20x11, 26x12, 30x15, 30x13, 36x30, 36x15, 36x14, 36x15, 36x9, 36x6, 38x18, 36x10, 36x24, 42x9, 48x36, 60x42, 84x66, 36x16, 9x36.
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RAYMOND MILL
5 Roll High Side.

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BELT: 1000 Ft. 60 In., 700 Ft. 42 In., 600 Ft. 36 In., 800 Ft. 30 In., 1642 Ft. 24 In., 517 Ft. 20 In., 297 Ft. 18 In., 1000 Ft. 14 In. & 16 In.
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Head & Tail—Pulleys—Takeup for all sizes.
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36 In. x 20 Ft., 3 Ft. x 30 Ft., 4 Ft. x 30 Ft., 54 In. x 30 Ft., 42 In. x 24 Ft., 5 Ft. x 30 Ft., 5 Ft. x 16 Ft., 5 Ft. x 60 Ft., 6 Ft. x 60 Ft., 6 Ft. x 70 Ft., 70 In. x 40 Ft., 5x30 & 8x84 Double Shell Dryers, 8x110, 7½x100, 8x125 & 10x20 Kilns.

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GASOLINE: 3 Ton, 5 Ton, 8 Ton, 12, 14 & 30 Ton.
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100—8000 gal. cap. Tank Cars.
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125 Ton 56' x 10'6" Platform 4 Section.

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2—Std. gauge, 25 ton Browning, shop overhauled.

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1—3′ Symons with coarse bowl
1—5½′ Symons with coarse bowl.
1—Traylor, bell head, 10″ feed opening.

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2—Komarek-Greaves 32″ dia. x 24″ face, rated 25 t.p.h. with extra shafts and rolls.

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3—5′x40′, 5′x48′, 6′x50′, all made by Vulcan Iron Works. Equipped with firing hoods, complete.
1—6′x60′
1—8′x135′ Allis-Chalmers, with 6x40′ rotary cooler.

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1—5′x30′ Cummer, mounted on steel I-beam frame, with furnace, etc.
2—6′x30′ Ruggles-Coles, double shell.
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1—6′x36″ silex lined, silent chain drive and motor.
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2—Dorr Combination Bowl & Rake Classifiers, 10′ dia. with 2′3″x19′8″ rake and 12′ dia. with 2′3″x21′4″ rake.

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1—4 roll High Side, with air classifier, Raymond exhauster, cyclone collector and inter-connecting piping.
1—4 roll High Side, equipped with whizzer air classifier, Raymond exhauster, cyclone collector connecting piping, etc.

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1—24″x40″ Pennsylvania, single roll.
2—18″x18″ Jeffrey, single roll.
2—40″x16″ double-roll, smooth shells.

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1—30″x24′ long, heavy steel frame, semi-portable.
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Shops and Yard at Newark, N. J., cover eight acres.

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1—20 ton Plymouth standard gauge gasoline
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SPECIAL
50 — 70-TON HOPPER CARS

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6,000 — 8,000 — 10,000 gal. cap.
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2—135 K.W., AC Generators, direct connected to Fairbanks Morse Diesel engines

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Austin Gyratory Crusher No. 107.
Buchanan Type B 12″ x 36″ Jaw Crusher.

Allis-Chalmers Double Roll Crushers, Type XX, Size 54″ x 24″, with new tire steel shells.

General Electric Constant Current Transformer, Type RO, Form P, Primary Volts 2300, 60 Cycle. Capacity 15-6.6-Amp. — 2500 Lumen Lamps in series.

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1—18″ x 30″ Telsmith Wheeling Roller Brg. crusher with 50HP, 440V, variable speed motor.
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1—20″ Traylor type TY for fine mesh with 25HP, 440V motor.
1—No. 5 Gates Gyratory crusher.
1—9″ x 15″ Traylor Chalmers Blake type crusher.
1—7″ x 6″ Hendy heavy-duty crusher.

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9—Gardner-Denver model S-55 Jackhammers 1″ and ⅞″ hex chuck.
12—2T 30″ ga. Grandby Automatic side-drop R.Brg. ore cars.
12—2T 30″ ga. improved Ajax ore cars.
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1—30″ x 14″ Traylor crushing rolls with 1—7½HP and 1—15HP motors, v-belt drive.

COMPRESSORS

1—1300 cu. ft. CP 2-stage type OCB compressor with 200HP motor.
1—600 cu. ft. I.R. type XB2 with 100HP motor, v-belt drive.

MOTORS

1—275HP 600 RPM, 440V, 3-bearing GE type ATB synchronous motor.
1—100HP 860 RPM, 440V Westinghouse.
1—75HP 860 RPM GE, 440V.
1—50HP 860 RPM, GE 440V, type I.
1—50HP 1800 RPM, 440V, Westinghouse type CS.
Large stock of small motors in stock.

LOCOMOTIVES

3—5T 30″ ga. GE battery locomotives with Edison type C8 80-cell batteries.
1—4T 30″ ga. GE with Edison type A5 batteries.
1—30 KW, 160V, DC, MG set with battery charging panel.
1—10 KW, DC Westinghouse MG set with battery charging panel.

PUMPS

2—12″ 26-stage, 80 GPM, 2600′ hd. Byron Jackson centrifugal dir. conn. to 100HP 3600 RPM, 440V, GE vertical motors with starters.
1—2 MRV, 25, IR motor pump, 135 GPM, 300′ hd. 25HP 3600 RPM motor.
1—RVH20, 116 GPM, 260′ hd. with 20HP 3600 RPM motor.
Large stock of small centrifugal pumps.

TRANSFORMERS

3—833 KVA 67,200/55,200 primary with 2400/4160/7200/12,470Y secondary.
2—200 KVA 55,000/49,500 to 2200/3810Y secondary.
3—150 KVA 55,000/49,500 with 2200/3810Y secondary.
All late type GE, air-cooled type H, form VD.

WEIGHTOMETER

1—Merrick mod. E for 20″ belt with automatic weight recorder, gear motor drive, etc.

PACIFIC MACHINERY CO., 156 Montgomery St., San Francisco, Calif.

FOR SALE

STEAM GENERATING PLANT—COMPLETE
3—150 H.P. 150# Keeler H.W.T. Boilers
1—350 H.P. 150# Stirling H.W.T. Boiler
1—250 H.P. McNaull H.W.T. Boiler
FEED PUMPS AND AUXILIARY EQUIPMENT
1—250 H.P. Fleming Engine connected to 200 K.W., A.C. Generator
1—500 K.W. Curtiss Turbine connected to G.E. 500 K.W., A.C. Generator
CONDENSER, PUMPS, PANELS, TRANSFORMERS AND MISCELLANEOUS PARTS PRICED TO SELL COMPLETE OR AS SEPARATE ITEMS.

W. M. SMITH & COMPANY
P. O. Drawer 1711
BIRMINGHAM 1, ALABAMA
Telephone 9-2134

EQUIPMENT FOR SALE

1—8 ton VULCAN Standard gauge gasoline locomotive.
1—4½ ton Plymouth 24″ gauge gasoline locomotive. Model FL.
1—56 ton BALDWIN 0-6-0 steam switching type locomotive, cylinder 19″ x 24″.
1—Lot Westinghouse 9½″ locomotive air pumps, rebuilt.
1—INDUSTRIAL WORKS 17 ton steam locomotive crane, 8 wheels, 52′ boom. N. B. boiler.
4—50 ton capacity FLAT CARS, std. gauge. 40′ long, steel underframes.
20—Small 30″ gauge 4 wheeled platform cars, Timken bearings: Bed 5′ x 8′.
1—WILLIAMS ½ yard "Favorite" type clam shell bucket.
1—P. & H. model 700-B crawler type gasoline dragline, 60′ boom & fairleads.

Send us your inquiries for rebuilt equipment.

Southern Iron & Equipment Co.
Plant & General Offices.
P. O. Box 2029, Atlanta 2, Ga.

PIPE New & Reconditioned

ALL SIZES for ALL PURPOSES
Cut and Threaded to Your Specifications
VALVES AND FITTINGS
UNITED PIPE & SUPPLY CO., NORRISTOWN, PA.

FREIGHT CAR PRICES REDUCED
Now only half of recent peak prices — $500 to $4250 each!
Which of these cars could YOU use?

8—Hopper, Twin, 50-Ton
40—Hopper, Triple, 50-Ton
50—Hopper, Side-Discharge, 50-Ton
50—Refrigerator, 40-Ft., 40-Ton
16—Refrigerator, 36-Ft., 30-Ton
50—Box, 40-Ft., 40-Ton
12—Box, Automobile, Steel, 50-Ft., 50-Ton
10—Dump, Magor, Automatic, 30-Yd., 50-Ton; lift doors
4—Dump, Western, Automatic 30-Yd., 50-Ton; lift doors
3—Dump, Western, 20-Yd., 40 and 50-Ton; steel floors
1—Dump, K&J, Lift-door, 37-Yd., 50-Ton
5—Flat, 40-Ft., 50-Ton; AB Brakes
6—Gondola, 50-Ton, High-Side, Steel
10—Tank, 8000 Gallon, 50-Toon

Perhaps this list also has some other cars you could use to very beneficial advantage now?
All cars are priced to sell!

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Iron & Steel Products, Inc.
40 years' experience
13490 S. Brainard Ave., Chicago 33, Illinois
"ANYTHING containing IRON or STEEL"

TYLER HUM-MER SCREEN, Type 31 complete with generator
INSLEY GUY DERRICK, 85′ Mast, 70′ Boom
BEDFORD OPEN SIDE PLANERS—37″ HEADS, 13′ and 15′ Beds
CHISHOLM-MOORE CYCLONE CHAIN BLOCK, 3 Ton
WATSON-STILLMAN JACK, 100 Ton
22,000 GALLON TANK ON 50′ TOWER

INLAND EQUIPMENT COMPANY
P. O. Box 477, 1608 Harrison Street
NASHVILLE 2, TENN.

LOCOMOTIVES

1—80 ton Baldwin 0-6-0 separate tender switcher, built 1925, A.S.M.E. boiler, piston valves, Walschaerts valve gear, now being overhauled and brought up to date on all I.C.C. requirements.
1—79 ton American 0-6-0 separate tender switcher, built 1920, superheated boiler, piston valves, Walschaerts valve gear, oil burner but can convert to coal, now being rebuilt and brought up to date on all I.C.C. requirements.
1—26 ton American 0-4-0 saddle tank, standard gauge, A.S.M.E. boiler, entire new firebox, completely overhauled, coal burner.
2—26 ton Porter 0-4-0 saddle tanks, standard gauge, built in 1928 and used only 15 months, A.S.M.E. boilers, oil burners, Walschaerts valve gear. These locomotives are in very fine condition and ready to go to work.

1—20 ton Whitcomb diesel-mechanical 36″ gauge locomotive, four wheel type. This locomotive built in 1936 and has had only light service. It is completely rebuilt with new wheels, chains, sprockets, reversing gear, and improved type bronze clutch plates. Caterpillar V-8 engine, 4 speeds each way, link-and-pin couplers.

1—Westinghouse 10½″ locomotive type cross-compound air compressor, rebuilt, suitable for either locomotive or stationary installation.

BIRMINGHAM RAIL & LOCOMOTIVE CO.
BIRMINGHAM 1, ALABAMA

NO PRIORITY NECESSARY
FOR SALE

LINN HAFTRAK DUMP TRUCKS

with All Steel, Boulder Dam type bodies. Excellent condition — purchased new in 1942

8 cu. yd. struck measurement capacity, heavy hydraulic hoist, open cab, auxiliary seat, chain sprocket drive, eight speed transmission with overdrive—15 ton capacity

11 Da-10 Cummins Diesel engines — $6,500.00 each . . . FOB southern shipping point

3 HA-10 Hercules gasoline engines — $5,200.00 each . . . FOB southern shipping point

ASSOCIATED METALS

349 Decatur Street, S.E., Atlanta 3, Ga.

Walnut 9412 **Main 4947**

POWER PLANTS

6 complete operating steam plants complete with 22 boilers, from 200 to 600 H.P. and 8 Turbo generators from 275 to 2750 KW.

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Courtlandt 7-1591

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349 Decatur Street, S.E.
Atlanta 3, Ga.
Walnut 9412

FOR SALE

Allis-Chalmers Gages 8—L Gyratory Crusher. Excellent Condition. $5200 F.O.B. Southern Shipping Point.
2 Complete Ore Washing and Crushing Plants.

•

Late model Davie 210 Feet per minute, 100 pound pressure, recently overhauled, price $1850, F.O.B. Southern Shipping Points.

WANTED

Used Steel, Pipe and Industrial Plants

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Atlanta Steel & Supply Co.
349 Decatur St., S. E. Atlanta 3, Ga.
Walnut 9412

Agricultural LIMESTONE CRUSHERS
Crusher ROLLS 16 by 36 manganese (Denver Mfg.)
Jaw Crushers 9 by 16 Farrell
Gyratory Crushers No. 5 and No. 3 Austin
Jack Hammers 12 Ingersoll Rand
Agricultural Limestone equipment all kinds
H. A. Woodworth Engineering Co.
705 Olive, St. Louis, Missouri

30 Ton Industrial Loco. Crane
20 Ton Brownhoist Loco. Crane
12 Ton Orton Loco. Crane
12 Ton Vulcan Locomotive Gas SG
15 Ton Industrial Crawler Crane
210 HP Fairbanks-Morse Diesel Motor
40 KW Generator AC
5 Ton Truck Crane
3 Drum 12x14 Steam Hoist
"STONE — the CRANE MAN"
502 Insurance Exchange Building
Detroit 1, Michigan

SPIKE ROLLS

36" x 48" JEFFREY — 2 Roll
Completely Rebuilt
New shells, new bearings, etc.
For friable materials, coal, etc.

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BOX CAR LOADER
LINK BELT

Pratt Portable — Size No. 1.

TERRE HAUTE GRAVEL CO.
34th St. and Ft. Harrison Rd.
Terre Haute, Indiana

FOR SALE

Byers model 100 combination crawler 15 ton crane and 45' boom dragline, also 1 yd. shovel, in very good condition.

BENDIX MACHINERY CO., INC.
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1—Dixie Hammermill 50" wide. Serial No. 1832, shipped from St. Louis plant new in May, 1944, in operation 90 days.
1—V-belt drive 720 to 1200 R.P.M. and spare sheave to drive mills, 1490 R.P.M.
1—Set spare belts.
1—Complete set new hammers.
ADDRESS BOX 313, c/o PIT & QUARRY
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DIESEL GENERATORS

D 17,000 Caterpillar ..... 85 K.W.
LD 909 Buda (2)..... 75 K.W.
68 C.P. Chicago.....150 K.W.
UD 18 International ..... 50 K.W.
UD 9 International ..... 25 K.W.
4E Buckeye .....100 K.W.

• • •

ROBERT SCHOONMAKER
Pt. Washington, Long Island, N. Y.
Roslyn 1220

¾ yd. B. & H. Model 206 Shovel with Waukesha Engine
50 x 24 Champion Jaw Crusher
36 x 24 Farrel Jaw Crusher
36 x 18 Farrel Jaw Crusher
24 x 12 Champion Jaw Crusher
19 x 8 Climax Jaw Crusher
16 x 8 I. C. Jaw Crusher on wheels
13A Telsmith Gyratory Crusher
#37 Kennedy Reduction Crusher with synchronous motor built in flywheel
3—14' x 30" Lewis Foundry & Machine Co. Worm Washers
3' x 12' Symons double deck Screen
4' x 12' Telsmith double deck Screen
5' x 10' Niagara single deck Screen
5' x 24' Positive Drive Revolving Screen
5' x 24' Trunion Drive Revolving Screen
4' x 18' Telsmith Revolving Screen
3' x 16' Trunion Drive Acme Revolving Screen
Double Drum Nova Hoist with 50 HP Nova 4 cylinder gasoline engine — direct connected
Barber Greene Bucket Loader
120' center 24" Conveyor, complete. With or without belt
50' center 24" Conveyor, complete. With or without belt
75' center 18" Conveyor, complete. With brand new belt
55' center 18" Conveyor, complete. With or without belt
50' center 18" Conveyor, complete. With or without belt

FRANK A. KREMSER & SONS, INC.
R. D. No. 2, Reading, Pa.
PHONE: LEESPORT 100
NIGHT PHONE: PHILA.: HANcock 7959

FOR SALE

1—Complete JOHNSON OCTAGONAL AGGREGATE PLANT. 400 yard volumetric capacity. Complete automatic operation.

Atlantic Equipment Company
503 Broad Street Station Building
Philadelphia 3, Pa.
Rittenhouse 8583

SHOVELS—CRANES

Bucyrus-Erie 37B shovel. Gas.
Bucyrus-Erie 20B Electric Shovel 1 yd.
Marion 37 Electric shovel 1¾ yd.
Marion 371, 1⅝ yd. Shovel, Crane, Dragline
Marion elec. shovel, 1¼ yds.
Lorain 75B shovel and crane, 1½ yds.
Bucyrus-Erie 42B Steam shovel-crane
P & H 650 shovel-crane
Browning 10 ton Truck Crane
P & H 208A, 8 ton Truck Crane
Byers Bearcat ⅜ revolving Crane, 5 tons cap.

SPECIALS!!

Allis-Chalmers cent. pump, electric, 2500 GPM, 50'
2 tons Drill Steel 1¼", shanked and bittered
Worthington 8" cent. bronze impeller, elec. Pump
Rotary Screen 4'x18' with Bucket Elevator 40'
200-ton 2-compartment Steel Rock Bin

BUCKETS—STONE SKIPS

⅞ yd. Blaw-Knox Clamshell, digging
⅞ yd. Hayward Clamshell, digging
Hayward ¾ yd. Standard Orange Peel
⅝ yd. Williams Clamshell, digging
¾ yd. Haiss Clamshell, digging
½ yard Haiss Clamshell, rehandling
¾ yard Haiss Clamshell, rehandling
Erie ¾ yd. Clamshell, rehandling
20—2½ to 3 yd. Battleship type Steel Stone Skips

TRACTORS—BULLDOZERS

Int. TD18 tractor with bulldozer, rebuilt
Int. TD40 tractor with bulldozer, rebuilt
Allis-Chalmers Model WS tractor with 8 yd. hydraulic scraper
Allis-Chalmers Model L with bulldozer

CRUSHERS—CRUSHER PLANTS

Roll Crushers, 54 by 20; 20 by 40; 30 by 24; 16 by 24; 16 by 42.
Sturtevant No. 2 Ring Roll Mill.
Gyratory Crushers: K.V.S. 80, 49; Traylor 8", 10", 12", 14", McCully 19", 8", 6".
Jaw: 10x23, 10x24, 10x36, 11x18, 11x21, 12x22, 12x24, 14x24, 14x25, 15x32, 16x32, 16x38

LOCOMOTIVES—CARS

American 60 ton, steam, std. ga.
American 45 ton, Saddle Tank
Vulcan 25 ton side saddle tank, steam, std. gauge
Plymouth 30 ton standard gauge Saddle Tank
Vulcan 30 ton Steam, Saddle Tank
Porter 12 ton, Steam Saddle Tank, 36" gauge
Baldwin Westinghouse 8 ton, 36" ga. Battery
Vulcan 6 ton, 36" gauge, gas
3—Western Steel 20 yard Air Dump Cars
3—30 ton Standard Gauge Flat Cars, rebuilt

CONCRETE PLANT & EQUIPMENT

2—Ransome 28S Mixers on skids, left and right hand
Koehring 34E Dual Drum Power
Fuller Kinyon Bulk cement unloader
Pauers—27E—2 Koehring, 1 Multi-Foote 1 Rex
Rex Pumpcrete Models 160, 180, 190 and 200

RICHARD P. WALSH COMPANY
30 Church St. New York, N. Y.

FOR SALE

24 x 50" Champion Jaw Crusher Rebuilt.
24 x 36" Farrell Jaw Crusher, rebuilt.
14 x 36" Cedar Rapids Jaw Crusher.
Allis Chalmers, Gates No. 6 Superior McCully Gyratory Crusher fine Reduction.
Traylor 36" Type TZ Gyratory Crusher.
Austin No. 107 Gyratory Crusher.
McLanahan 18 x 24" Single Roll Crusher.
McLanahan 21 x 42" Single Roll Crusher.
Fairmont 36 x 60" Single Roll Crusher.
Williams "Comet" 4 roller Mill, complete.
Hardinge 4' x 8' Pebble Mill with Pebbles.
Symons Cone Crushers 2', 3' and 4'.
Two Bucyrus Erie Diesel Cat Cranes.
Marion No. 480 Steam Crawler Crane.
Insley ½ yard, ¾ swing Gas Crawler Shovel.
P&H No. 206 Gas Crawler Crane-Dragline.
Sauerman ¾ yard Drag Scraper Outfit.
Atlas 2 yard V Shape, all steel Dump Cars.
Chain & Bucket Elevator, 14x7x7¼" buckets.
Belt & Bucket Elevator, 14x7x7¼" buckets.
Venn Severin 125 HP Diesel Engine, Rebuilt.
Meitz & Weiss 150 HP Diesel Engine, Overhauled.
2—Fairbanks 180 HP Diesel Engines, complete.
2—Buda 180 HP Diesel Engines, rebuilt.
Busch-Sulzer 165 HP, 2300 Volt Gen. Set.
McIntosh & Seymour 300 HP, 2300 Volt Gen. Set.
Barber Greene & Link Belt Bucket Loaders.
100 Stone Skips 12' x 91" x 45" deep.
22½ ton Ohio Std. Ga. Electric Loco. Crane.
Natural Gas & Steam Engines, Compressors, etc.

MID-CONTINENT EQUIPMENT CO.
710 Eastgate Pa. 2290 St. Louis 5, Mo.

18 ton Plymouth std. ga. gas locomotives. New 1942.
15 ton Whitcomb std. or 36" diesel locomotives. New 1942.
300 HP McIntosh Seymour Diesel Generator set. 60 cycles, 2300 volts. Heavy Duty. Full equipment.
5½ ft. Symons Cone Crusher, Coarse bowl. Standard head.
2 yd. Williams Hercules heavy duty digging Clamshell.
35 HP Clyde 2 drum Gasoline Hoist & swinger.
80 ton American 6 wheel Switching Locomotives. Built 1925.
500 ft. Ing. Rand 2 stage portable Diesel Compressor.

MISSISSIPPI VALLEY EQUIPMENT CO.
513 Locust Street St. Louis 1, Missouri

FOR SALE

300 DEMPSTER-DUMPSTER & BROOKS LOAD-LUGGER BUCKETS & HOISTS

IN GUARANTEED USED CONDITION AT A REAL SAVINGS

GENERAL TRADERS
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1—13 x 30 Farrel Jaw Crusher
1—10 x 36 Farrel Jaw Crusher
1— 6 x 36 Farrel Jaw Crusher
1—14 x 28 Reliance Jaw Crusher
1—#40 Telsmith Reduction Crusher
2—#32 Telsmith Reduction Crushers
1—6" Allis Chalmers Reduction Crusher
1—60' Center 26" bucket double chain elevator
1—50' Center 18" bucket chain elevator
1—Dorr Sand Classifier
1—48" x 18' Telsmith washing screen —6" x 8" Pump direct connected to 75 H.P. motor.

BLUE BALL MACHINE WORKS
Blue Ball, Pa.

FOR RENT

Marion Gas-Electric Shovel, 1¼ Yard Bucket.
Insley Shovel, ⅝s Yard Bucket.
LeTourneau Rooter.
O.P.A. Prices.

THE TILDESLEY COAL CO.
4011 Carew Tower, Cincinnati, Ohio
Phone LD 44

FOR SALE

1—200 H.P. Allis-Chalmers Motor, 580 R.P.M. 440 V. 3 P. 60 C.
1—250 H.P. Westinghouse Motor 575 R.P.M. Induction Type, 220 V.
1—150 Westinghouse Motor
1—225 H.P. Allis-Chalmers Motor 580 R.P.M. 2200 Volts
1—Westinghouse Steam Turbine to 375 K.V.A. 2200 V. Generator
1—350 H.P. G.E. Induction Motor 220 Volts
1—200 H.P. G.E. Motor, 600 R.P.M. 440 Volts
1—5 Ft. Radial Drill
1—4 Ft. Radial Drill
1—Planer 25" x 8' x 36" Travel
1—6" Georgia Iron Works Pump and motor

W. M. SMITH & COMPANY
P. O. Drawer 1711
BIRMINGHAM 1, ALABAMA

FOR SALE
STEEL CARS

Double Side Dump 3/16" plate Construction, Electric Propelled with 10 H.P. Direct current, 230 Volt Motor Complete with drum controller and emergency brake. Size 7' long, 5' wide, 5' high—mounted on 2 sets of 24" Gauge trucks.

Albert Schulman
45 Broadway Brooklyn 11, N. Y.

FOR SALE

1—used Model 450 1¼ yard Marion Steam Shovel. Good condition and priced right for immediate shipment.

Bluefield Supply Co.
Bluefield, West Virginia

FOR SALE

1—New steel frame—wood siding—easily demountable coal tipple with link belt 65 ft. x 36 in. picking conveyor, Simplex 4 x 8 vibrating screen, Hercules Power unit 24 in. steel feeder, two 80 ton bins for R. R. loading. Span for crusher—also portable office and 40-ton, 34 ft. truck scale.

MURDOCK CONSTRUCTION COMPANY & S. A. RUEBEL & CO.
1654 Sherman Ave., Norwood, O. Ph.: Melrose 1959

100 TONS — NEW

SURPLUS STEEL

¼ in., ½ in., and ¾ in.
Armor Plates

E. Cohn & Sons
CEDAR RAPIDS, IOWA

BUSINESS OPPORTUNITIES

Lime Plant with equipment, 8 tenant houses, 3 kilns. This plant has been in operation for 25 years, except for the last 2 years. Is located 30 miles from Birmingham, Alabama. Machinery and equipment worth $100,000. Unlimited supply of high-grade rock. Price $50,000, terms. A money-maker for an experienced man. Further information, **Grover C. Elmore, 100 North LaSalle, Chicago, Fra. 2650.**

LOCOMOTIVE, Lima 80 ton, 6 wheel switches, National Board Boiler, 200 lbs. pressure, thoroughly modern, guaranteed condition, for sale or rent.

SHOVEL, Electric, Marion No. 4160, with either 4 yd. or 5 yd. dipper, Ward-Leonard control, guaranteed condition, sale or rent.

DIESEL ENGINE, one Chicago Pneumatic 200 HP, 6 cylinder 8x10½, V-belt pulley, weight about 20,000 lbs., new condition.

CRUSHING EQUIPMENT, one 36x42 and one 24x36 Jaw Crushers with pan feeders.

CONVEYOR or EQUIPMENT, large quantity 36" mechanical parts and good used 36" belt.

Modern equipment of all kinds for Contractors, Quarries, etc.

A. J. O'NEILL
Lansdowne Theatre Building
LANSDOWNE, PA.
Phila. Phone: Madison 8300

CONVEYOR AND PARTS

1800' 48"x8-Ply prewar conveyor belt
700' 30"x6-Ply prewar conveyor belt
30" trough belt conveyor, 125'
24" trough belt conveyor, 100'
New and used conveyor belt, pulleys, idlers
Jeffrey Foundry mold type conveyor, 42"x150'
Steel plate conveyor, 47"x30'
Jeffrey Standard Steel Apron Feeder, 24"x13'
L-B single flight conveyor, 10"x25'
Belt trippers for 14", 16" and 18" belt
Screw take up for belt conveyor, 12" to 12'
Screw and gravity conveyors

BUCKET ELEVATORS, CHAINS, PARTS

Bucket elevator with 9" buckets on belt, 50'
20" bucket elevator, 60' on 847 chain
8" bucket elevator on belt or chain, 35"
Continuous 14"x58' bucket elevator on chain
Continuous 14"x40' bucket elevator on belt
Grain elevators 5" to 18" buckets on belt
300' Jeffrey #1123 roller chain with attachments
No. 847 and #825 chain with attachments
1000' Evarts detachable chain #124 and 114
Large Assortment new roller chain sprockets
Chain for elevators and driving

CRUSHERS, ROLLS, MILLS

Buchanan double roll crusher, 14"x30", manganese
Allis Chalmers 16"x42' double roll crusher
Cedar Rapids 15"x24" jaw crusher
New England 11"x21" jaw crusher, cast steel frame
Scholl 9"x16" jaw crusher, Reliance type
Acme 12"x24" jaw crusher
Traylor "BULLDOG" 11" gyratory crusher
Sturtevant No. 0 Rotary Fine Crusher
Midwest #2 Hammermill
Jeffrey 24"x20" type "B" hammermill
Robins double roll coal crusher, 24"x30"
Single roll spiked crusher, 24"x24"
Coal Pulverizer, roller bearings, Simplex
8 tons of steel crushing balls, 1" to 2"
American Standard 24" Disintegrator

VIBRATING AND REVOLVING SCREENS

Gyrex double deck 4'x10' vibrating screen, B
Simplicity three deck 3'x6' vibrating screen
Leahy single deck 4'x9' double vibrator
Plat-O single deck, 3'x6' vibrating screen
A-C double deck 4'x10' vibrating screen
A-C double deck 3'x 8' vibrating screen
4 Hummer single deck 3'x5' vibrating screen
Hummer single deck 4'x5' vibrating screen
15 cycle generators for Hummer screens
Revolving screens, 42"x16', 4'x22', 6'x15'

MISCELLANEOUS

Three Dings Magnetic Pulleys, 18" face, 24" dia.
Two Dings Magnetic Pulleys, 30" face, 30" dia.
270 New 4" and 7" 1-A Die Cast V pulleys
Chicago NSB air compressor, 14"x12", 529 CFM
National double drum 25 hp electric hoist
Sauerman double drum 50 hp electric dragline
N. Y. Air Brake 6B duplex steam air compressor
Speed reducers: 33-1, 42-1, 70-1
Electric motors, 1 to 75 hp. AC.
Morris 6F manganese lined sand pump,
Ellicott 4" belt driven sand pump
Two 6" centr. water pumps, vertical, 15 hp.
Worthington 25 hp electric water pump
Gasoline locomotives, 36" gauge, 4 and 8 tons
Six 36" gauge 1 yard V side dump cars
400 hp V belt double pulley unit with belts
Waukesha 4 cyl. gasoline engine with speed red.
3 steel pontoons, 4'x4'x14' of ¼" plate

G. A. UNVERZAGT & SONS
136 Coit Street, Irvington, New Jersey

(3) I. R. reconditioned wagon Drills, late model D-2, X-71, pneumatic hoist, 10 ft. changes. $750.00 each.
(1) 310 cu. ft. two-stage LeRoi Diesel Portable Compressor, overhauled. $3000.00.
(1) 18" x 36" Iowa Portable Crushing outfit with Murphy Diesel, bin, etc.
Several smaller portable jaw crushers
(1) ½ cu. yd. Byers Crane, overhauled. 30 ft. boom. $2500.00.
(1) R-D 7 Caterpillar Bulldozer & Scraper.
(1) late model CH-200 Brooks Loadlugger with 2 yd. buckets. $600.00.

M. WENZEL, 2136 Jefferson, Kansas City, Missouri

Porter 18-ton & Vulcan 17-ton steam 36" gauge S/T locomotives, 100% rebuilt, tested.
Milwaukee 8-ton gas locomotives, 36" ga., rebuilt.
Whitcomb 8-ton gas locomotives (4), 24" gauge.
B-Erie 50B steam 2½ yd. shovel, 100% rebuilt.
Bucyrus 80B steam crawler shovel, 48' boom.
Marion electric 4-yd. & 3-yd. shovels, #125.
Page 2-yd. Diesel dragline, 65' boom.
Monighan 1½-yd. drgl., 80' bm., stm., skids, cheap.
American steam railway ditcher-crane, 28' boom.
Gyratory crushers, 27" & 16"; 7" Newhouse.
American-Champion 24"x50" steel jaw crusher.
Worthington Superior 42"x40" jaw crusher.
Cedar Rapids travel type blacktop plant.
Euclid 6-yd. bottom dump crawler wagons (8).
Boilers (2), 42"x90" Clyde, good.
Bucyrus 30' shovel boom only, for 50B machine.

H. Y. SMITH COMPANY
828 N. Broadway — Milwaukee 2, Wisconsin

SAND & GRAVEL PLANT, NEW IN 1937, FOR SALE AS A UNIT OR INDIVIDUAL ITEMS SEPARATELY

18" x 98' Telsmith Plain Bearing Belt Conveyor with Motor
18" x 76' Telsmith Plain Bearing Belt Conveyor with Motor
36" x 20' Telsmith Sand Drag;—3 hp Geared Head Motor
16" x 5' Telsmith Plate Feeder
9" x 21" Telsmith Roller Bearing Jaw Crusher with 25 hp Motor
40" x 15' Telsmith Std. Rotary Washing Screen with 25 hp Motor
Ingersoll-Rand Electric Pump with Motor. Approx. 700' of 15" pipe. Five hp motor for return belt.
All above complete with V-belt drives, starters, etc.

ROAD & RAILROAD SUPPLY CO.
475 FIFTH AVENUE, NEW YORK 17, N. Y.

Reliable Diesel Power Equipment for Immediate Shipment

1—1500 HP Nelseco, solid injection with AC Generator
1375 HP (2 units) McIntosh-Seymour with General Electric AC Generators, complete plant
1—750 HP National Superior (can be supplied with AC Generator)
4—400 HP DeLaVergnes with AC Generators
2—400 HP DeLaVergnes with DC Generators
2—300 HP Fairbanks-Morse with AC Generators
2—200 HP Atlas power units
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75	Northw.	HW	220	1740
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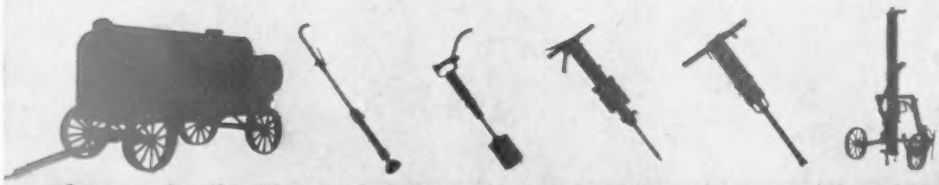

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